THE CULTIVATOR:

A MONTHLY PUBLICATION, DEVOTED TO AGRICULTURE.

I KNOW OF NO PURSUIT IN WHICH MORE REAL AND IMPORTANT SERVICES CAN BE RENDERED TO ANY COUNTRY, THAN BY IMPROVING ITS AGRICULTURE — *Wash.*

VOL. V. NO. 3, WASHINGTON-ST. ALBANY, N. Y. FEBRUARY, 1839. No. 12.

Conducted by J. BUEL, of Albany.

TERMS.—ONE DOLLAR per annum, to be paid in advance. Subscriptions to commence with a volume.

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The Cultivator is subject to common newspaper postage.

☞ Price of the published volumes, 50 cents per vol. stitched—the four volumes bound together, $2.75—bound in two volumes, $3—the four vols bound each separate, $3.25.

THE CULTIVATOR.

TO IMPROVE THE SOIL AND THE MIND.

☞ An extra sheet of 16 pages accompanies this No. making 32 pages gratuitous matter with this volume.

☞ A LIST OF AGENTS, principally of gentlemen who have volunteered as such, accompanies this number. ☞ Any person who forwards us Ten Dollars, for ten subscribers, becomes virtually an agent, and is entitled to the eleventh copy for his trouble, or to ten per cent, and in that proportion for any greater amount. Post-masters are particularly invited to receive subscriptions—a legitimate object of the post-office law being, in our opinion, to facilitate the diffusion of useful knowledge among the people.

☞ An interesting communication from Mr. Garnet, of Virginia, and several other favors of correspondents, are unavoidably postponed till our next.

Close of the Volume.

This No. closes the fifth volume of the Cultivator. We have endeavored to make it useful to the great cause of improvement which it professes to promote; and in this effort we have been ably sustained by more than TWO HUNDRED CORRESPONDENTS, from different parts of the Union. To these gentlemen both the Conductor and the Patrons of the Cultivator are under great obligations; and we feel warranted in tendering to them, in behalf of our subscribers as well as ourselves, our hearty thanks. But this, we trust, is but a small portion of their reward: the consciousness of doing good to others—of having discharged a high obligation to society—is the *best* reward to a philanthropic and benevolent mind. Who can pretend to limit the beneficial effects, present and remote, which will result to the nation from their concentrated labors—*to improve the soil and the mind!* We see every where the most salutary changes, in the improvement of our husbandry, and in the condition of farmers, produced by the increased circulation of agricultural periodicals; and yet, in our opinion, we see but the germ of their usefulness. And is there a member of society, be his situation what it may, that can say, *he* is not benefited by this change? Putting our own labors out of the question, is there a subscriber, who after attentively reading *this* number, will say, that he may not be benefited by the matter it contains—more than one dollar—the price of his annual subscription? We think not. These considerations, we trust, will stimulate our correspondents to persevere in their labors of usefulness. We have a stock of individual experience and useful knowledge in our country, which, if drawn out and diffused over the land, would cause it to teem with plenty.

We feel also under great obligations, and wish here to make our acknowledgments for them, to the numerous class of gentlemen who have volunteered as agents—from a wish to promote useful improvement—to extend the circulation of the Cultivator.—We earnestly invite a continuance of their co-operation.

Board of Agriculture.

In the bill reported to the last legislature, by Mr. L. F. Allen, for the improvement of agriculture, there is a provision for the establishment of a Board of Agriculture. The subject has been recommended, by the Governor, to the consideration of the legislature. Propositions for establishing similar boards in Virginia and North Carolina are now, we believe, before the legislatures of those states. The bill of Mr. Allen provided further, that a room in the new state buildings should be assigned for the use of the board, and that the room should also serve as an agricultural museum.

As both the board and the museum may appear of doubtful utility to many, we will endeavor to explain, as far as we are able, the objects of both,—or at least to suggest some of the advantages which may be expected to result from their establishment, sufficient, we think, to warrant any expenditure they may require from the state.

It is matter of general notoriety, that the agricultural staples of a district, or state, are subject to fluctuation and change. These changes arise from exhaustion of the soil for particular crops;—the introduction of new articles of culture;—the fluctuations of the market;—the demands for new and particular products, or from other unforeseen causes. We have witnessed many of these changes in our day; and unless we mistake the signs of the times, other changes of importance are on the eve of taking place, at least in many districts, by the extension of root culture, the silk business, and the fabrication of beet sugar. To facilitate these changes, which are often indispensable, it is important that our farmers should be early and correctly advised of the best modes of managing the new articles of culture, and of their products and profits. Thousands, and tens of thousands, may be wasted in useless experiments, and a useful and profitable branch of culture may get into disrepute and be neglected, for the want of the requisite knowledge for its management.

The upper valley of the Hudson, and the valley of the Mohawk, were, not very remotely, the great wheat growing districts of the north. Wheat was their staple product, and this wheat constituted the great mass of farm produce which was sent down the Hudson from this city and neighborhood to New-York. These districts do not now produce enough wheat for their own consumption. Wheat culture has given way to cattle and sheep husbandry, and to the raising of coarse grains.

The great staples of our southern states, a few years ago, were rice, indigo and naval stores. Cotton was then a stranger to their soil; but it is now almost their entire staple, and constitutes by far the largest article of export from the United States.

The New-England states formerly raised grain and provisions sufficient for their consumption, and to export. They are now importers to a large amount. Manufactured goods constitute their principal exports.

Root culture is but of comparative recent introduction into Great Britain. It has changed her whole system of husbandry, as that of the sugar beet has that of France. The advantages which have resulted to those countries, from root culture, have been vastly great; and New-York, we have no doubt, will ere long reap from it like advantages. We are now much in need of manual instructions for cultivating the beet, and manufacturing the sugar. The French farmers have been immensely profited by the exertions of their government to collect and diffuse a knowledge of the best modes of practice in the beet sugar business; and even now that government is offering large bounties for new improvements in the manufacturing processes. France now makes 100,000,000 lbs. beet sugar per annum.

The silk business is exciting great attention among us. Our soil and climate are adapted to it. Managed as a household concern, it promises to become a source of individual and national wealth. But we lack experience, and we lack instructions which may be implicitly followed. We import silk to the amount of 20,000,000 dollars a year, produced in a soil and climate very similar to our own. Under the instruction and fostering care of the government, the silk business might soon become a great and profitable one to New-York.

These two new branches of agricultural labor, the beet and the silk business, have already attracted the notice of adjoining states, whose legislatures have offered liberal bounties to encourage their prosecution. Connecticut gives a bounty of one dollar for every hundred mulberry trees planted in the state, for the fabrication of silk, and fifty cents per pound for every pound of merchantable silk made in the state. Massachusetts gives a bounty of one dollar for every ten pounds of cocoons produced, and one dollar for every pound of silk reeled or thrown in the state; and a liberal bounty on sugar manufactured from the beet root. Vermont gives a bounty of ten cents a pound on cocoons; and Pennsylvania and New-Jersey, we believe, have also offered bounties to encourage the silk business. New-York, no doubt, stands ready to follow the praise-worthy example of her sisters, in these as in other matters deeply interesting to her agriculture—as soon as she has settled the question of party ascendency. But hitherto her statesmen have been too much engaged in *political* legislation, involving banks, rail-roads and canals, to cast a thought upon the humble claims of agriculture; which, having had nothing to give to party, would of course be last to be served by party.

New grains, new grasses, new roots and plants, new breeds of animals, new implements of farming, new manures, and new modes of culture, are constantly coming into notice. Many of these would prove valuable in our husbandry. Our agricultural population are so dispersed, their means of information so limited, and they are withal so distrustful of whatever is new, that improvement with them progresses slow. But were there a central board, who would take early cognizance of these matters, and publish their opinions upon them; who would collect, at home and from abroad, all choice seeds that promise to become an acquisition to our husbandry, and distribute them among careful and discreet farmers, the progress of improvement would be greatly accelerated. In regard to new farming implements, there are and will be many of intrinsic merit—and there are and will be others that are worthless.—The farmer cannot distinguish well the good from the bad without trying them, and this he has seldom the opportunity of doing thoroughly. The consequence is, he is often deceived; and is afterwards deprived of the benefits of those which are good, from an honest distrust of his own judgment as to their merits. The matured opinions of competent judges, acting under the authority of the state, would go far to prevent imposition, and to facilitate the general introduction of the most valuable kinds.

There are already several articles in extensive use in our country, and for which the home demand must increase, which might be profitably cultivated among us, were their culture once fairly introduced, and the processes of preparing them properly taught.—We will particularize madder, woad and weld, plants in extensive use in dying cloths. We import annually of these to the value of some millions of dollars. We have grown them all on a limited scale, and have no doubt but they may be made profitable farm crops.

Having made these preliminary remarks, we are now prepared to answer the question—

In what way would a Board of Agriculture benefit the State?

A Board of Agriculture should consist of three or more intelligent men, and a secretary, meet perhaps quarter-yearly, and receive a fair compensation for the time necessarily devoted to the duties of their office. The secretary should devote his whole time, under the direction of the board, to the interests of agriculture—

1. In collecting, arranging and publishing statistical and other useful information in regard to rural affairs.

2. In collecting and distributing seeds of such kinds of agricultural products, as may promise to profit our husbandry; together with the modes of their culture, management and preparation for market.

3. In receiving, labelling and arranging, models of implements, geological specimens, seeds and samples of rare or excellent products of the soil, portraits of fine animals, donations of books, &c. and in exhibiting them to visitors, and explaining their objects, qualities and promised advantages.

4. In answering the inquiries of agricultural men, on all matters relating to any branch of husbandry, or any article of culture.

5. In corresponding with societies and individuals, on matters promotive of the interests of agriculture.

The due performance of the above enumerated duties could not fail to be very serviceable to the state, in promoting the improvement of her agriculture. But there are other duties which might be performed by the board, of unquestionable benefit, should one be instituted, and the legislature think proper to confide such to them, to wit:

6. Examining, testing and deciding upon the me-

rits of all new implements of husbandry, offered for their inspection—and upon which the board might be authorized to award discretionary premiums, where the articles should be judged highly meritorious—and thereby giving them a character upon which the public might rely. And,

Last in order, though perhaps first in importance, a Board of Agriculture might write, compile, or procure to be written, and printed, books upon agriculture, the veterinary art, orcharding, gardening, rural embellishment and household economy, suitable for the common school libraries of an agricultural population.

In the several duties above enumerated a Board of Agriculture would do much good. Such a board has been eminently useful in Great Britain. Such virtually, in France, is the Royal Central Society of Agriculture—its premiums, and its laboring members, being paid from the public treasury.

The great question with many will be,—not what will be its ultimate benefit—but *what will be the cost?* The man who plants an apple tree, does not expect an immediate return for his outlay. He knows that he has to wait years for his remuneration; but he knows it will come; and that when it *begins* to come it will go on progressively increasing in profit, till he has returned to him his fifty or his hundred fold. So it is with expenditures for improving agriculture; the returns, though not immediate, are progressive and certain. The cost of a Board of Agriculture, however, will depend much upon what they are allowed by law to expend. Their pay and expenses would probably not equal the pay of many individual inspectors and other officers under the government; and would hardly amount to a tenth of the expense wasted last winter, in the boyish struggle in our legislature—to get credit to *party* for a short session.

An agricultural museum would be a matter of no great expense, but one of manifest utility. It would be taken care of by the secretary, with perhaps occasional assistance. Geological specimens might be furnished from the collections made by our geological corps. Models of agricultural implements might be required from the patentees or proprietors who exhibit them for inspection. Books would accumulate, as donations; and portraits of choice animals would be presented by breeders, as a matter of interest. Specimens of agricultural products, and seeds of rare vegetables, would be tendered by our farmers, from motives of pride as well as of public usefulness. Foreign seeds and agricultural curiosities would be collected by our citizens travelling abroad, and by those engaged in foreign commerce. Every citizen would feel disposed to add to the collection whatever might be useful or curious of the productions of the soil. The hall would become an agricultural news-room—a central point of resort for citizens and strangers, who wished to acquire information, or should be desirous to communicate it, on the all-important business of agriculture. It would also afford an appropriate place for lecturing upon practical agriculture; and upon the sciences connected with its improvement, in the winter months—subjects which may yet become as popular and useful as phrenology and animal magnetism.

The Highland Agricultural Society of Scotland, to which we may safely refer for models of usefulness, is erecting a magnificent hall, at an expense of nearly 30,000 dollars, to serve as an agricultural museum. In this are to be deposited models of all known agricultural implements and agricultural machinery—an assortment of seeds, grains and grasses adapted for British culture—specimens of various kinds of timbers produced by forest trees—a collection of insects and grubs known as inimical to trees and plants—samples of dyes derived from native shrubs, with specimens of shrubs themselves—specimens of minerals, ores and rocks existing in Scotland, and adapted for useful purposes—original maps and surveys, explaining the geological structure of different countries, and showing where coal, lime, iron, stone, and other valuable mineral products abound—models and portraits of different varieties of stock, of the most approved breeds, showing their respective points and characters, &c. &c. Such a museum, we believe no one will deny, would be of value to any state,

Gov. Seward's Message.

It is neither our province nor intention to take notice of this able state paper, further than it relates to education and to agriculture, two subjects which, however seldom associated in the public mind, are nevertheless intimately connected, in what best promotes the great interests of our republican institutions. Education in the higher branches of knowledge, including natural science, and the application of the principles of the latter to productive labor, would multiply the legitimate sources of our wealth, and raise the agricultural class, in intelligence and in spirit, to the elevated rank assigned to them in our political charter, and which the safety of the republic requires they should occupy. This class once enlightened, would know how to appreciate the advantages of education; and having the means and the disposition, would take care to provide liberally for the education of their children.

The governor well remarks, that crime decreases as useful knowledge is disseminated. There are abundant statistical facts, to verify this remark. By useful knowledge, we mean particularly, that knowledge which incites to, and augments the fruits of, productive industry—that knowledge which gives to the possessor ample power, not only reputably to provide for himself, but to administer to the wants of others, and to advance general improvement in the condition of the human family.

"The standard of education," says the Message, "ought to be elevated not merely to that which other states or nations have attained, but to that height which may be reached by cultivation of the intellectual powers, with all the facilities of modern improvements, during the entire period when the faculties are quick and active, the curiosity insatiable, the temper practicable, and the love of truth supreme. The ability to read and write, with the rudiments of arithmetic, generally constitute the learning acquired in common schools. To these our colleges and academies add *superficial instruction in the dead languages, without the philosophy of our own; scientific facts, without their causes; definitions, without practical application; the rules of rhetoric, without its spirit; and history, divested of its moral instructions.* It is enough to show the defectiveness of our entire system, that its pursuits are irksome to all except the few endowed with peculiar genius and fervor to become the guides of the human mind, and that it fails to inspire either a love of science or passion for literature.

"Science is nothing else than a disclosure of the bounties the Creator has bestowed to promote the happiness of man, and a discovery of the laws by which mind and matter are controlled for that benignant end. Literature has no other object than to relieve our cares and elevate our virtues. That the pursuits of either should require monastic seclusion, or be enforced by pains and penalties upon reluctant minds, is inconsistent with the generous purposes of both. Society cannot be justly censured for indifference to education, when those who enjoy its precious advantages manifest so little of the enthusiasm it ought to inspire. All the associations of the youthful mind, in the acquisition of useful knowledge, must be cheerful; its truths should be presented in their native beauty and in their natural order; the laws it reveals should be illustrated always by their benevolent adaptation to the happiness of mankind; and the utility and beauty of what is already known should incite to the endless investigation of what remains concealed. If education could be conducted upon principles like these, the attainments of our collegiate instruction might become the ordinary acquirement in our common schools; and our academies and colleges would be continually enjoying new revelations of that philosophy which enlightens the way, and attaining higher perfection in the arts which alleviate the cares of human life."

We are here urged to raise the standard of education; we are admonished of the insufficiency of our colleges and academies in teaching what is most useful in the important business affairs of life; and we are told, that under a proper system of education, all the useful attainments of college instruction, might become the ordinary acquirement in our common schools.

The great source of the evil here complained of, we apprehend, is to be found in a vitiated public taste, formed too much after the fashion of the old continent—a predilection for what is showy, and superficial and transitory—in preference to that which is useful and substantial. With us, "merit should make the man, and want of it the fellow." Yet such is the homage we are accustomed to pay to a fine exterior, to polished manners, and to professional and mercantile pursuits, that the farmer or mechanic, seeks these professions and employments for his son, as the surest means of giving him fame and fortune, and in the hope, too, often, of sharing himself in the anticipated distinction of the boy. Hence, in subserviency to the public taste, is the inutility of our higher schools of instruction to the useful branches of industry. "I am ashamed," says Prof. Gordon, of Clinton College, "that so little of our boasted learning is practical—tamed—domesticated, and familiarized to the avocations of men.—When the young man graduates with honor, he is then unfit for any occupation—he has still to learn his profession. Whereas, the college, or university, ought to fit young men at once for the occupations they are to follow." The plan of the professor might be carried out, with facility, in the great business of agriculture, and the time and expense of the noviciate of life greatly lessened. A school of agriculture would teach his head knowledge, and his hands labor, at the same time, without impairing the value of either branch of instruction. Give him the "scientific facts" of the college, and he would explain "their causes," and demonstrate their effects and their utility in *field practice.* Give him the literary polish of the higher schools, and you would fit him for the civil duties of life. And give him, superadded to his scientific and literary teachings, a practical knowledge of the best modes of farming, and he comes forth from the school, highly qualified for usefulness—for *head*-work or *hand*-work, conjointly or separately. He will have no occasion to be ashamed of his profession, or to seek the bar or the counter, or to peddle pills or politics, to become respectable and respected.

"We seem at last," says Gov. Seward, "to have ascertained the only practicable manner of introducing normal schools into our country. It is by engrafting that system upon our academies."

We are sorry to question the correctness of this conclusion. We are afraid that but few, very few, of the young men who are participating in the public bounty in our academies, will be disposed to follow the humble business of teaching, longer than to acquire the means, or until an opportunity presents, of embarking in a more lucrative employment. The academy is considered a sort of stepping stone to the liberal professions; and we doubt whether those who are set apart for teachers can divest themselves of the predilections of the school.

We have another cause of doubt. From the character his excellency has given us of our academic studies, we are obliged to doubt the competency of these normal schools to qualify teachers for instructing a rural—an agricultural population. We beg not to be misunderstood. Academies may be considered purely literary institutions. They teach little more than ordinary schools, that concerns rural economy, or the arts of productive labor. Now it is a conceded truth, that boys should be taught what they are to practice when men. A vast portion of our male children are destined for agriculture and the arts, and under proper teachers, might acquire much elementary knowledge in their future business. Will the pupils from our existing normal schools possess either the disposition or ability to impart to them this preliminary, but very useful instruction? So far as our knowledge goes, no normal schools have yet proved successful, but such as have been exclusively devoted to the instruction of teachers; and in most cases where they have proved successful, we believe, the pupils have been instructed, in a greater or less degree, in the principles and practice of agriculture—qualifications considered useful, if not essential, in the teachers of a rural population. Normal, like agricultural instruction, holds but a secondary grade, when connected with literary schools; and the inferior will always be made subservient to the higher study.

The allusion, in the message, to the promised utility of common school libraries, is forcible and concise; and we hope the request to the legislature, to give its "co-operation in the *beginning* of this wise and momentous policy," will be promptly complied with.

"For the evil of our whole system," concludes Gov. S. on this subject, "there is a remedy, simple, economical and effectual—the establishment of a department of education, to be constituted of a superintendent appointed by the legislature, and a board to be composed of delegates from subordinate boards of education to be established in the several counties. The state board might exercise a general supervision, with powers of visitation of the colleges, and the county boards the same powers in their respective counties. The duties of all these officers, except the superintendent, ought to be discharged without compensation, and the tenure of office might be made so long as to secure efficiency. I am satisfied the state abounds with competent individuals who would assume those duties without other remuneration than the consciousness of rendering enlightened and patriotic service in the cause of education."

Boards of Education have been established in some of the neighboring states, and the one in Massachusetts, in particular, has already had a highly salutary influence towards improving her system of public education.

We extract below all of the message which relates directly to agriculture, and shall reserve our remarks upon it to a future occasion. It forcibly impresses upon the consideration of the legislature, the importance of providing for the improvement of this primary, but too much neglected art.

"The science which involves the physical laws most open to our investigation, and to which the primeval law of our existence compels us, and the art which precedes all other inventions, and whose cultivation leads to plenty, and is cheered by health and contentment, are the last which receive the patronage of phylosophy, or attain the favor of government. Mankind learned the distances and laws of planets, and even the periods of comets, before they conceived the mysteries of vegetation; and the fine arts were perfected in ages when agriculture, loaded with the superstition of centuries, was consigned to slaves. That this should have been the experience of other ages and other countries is easily explained. The powers of government have always been vested in classes or individuals farthest removed from the tillers of the soil; and ambition and

pride have sought gratification in conquests and in the homage of the fine arts. But it must not, it cannot be so here, where the agricultural interest is sovereign, and as it furnishes all the means, rightfully supplies the motives, and directs the action of the government.

"Every acre of cultivated land could be made to yield, with the expense now bestowed upon it, products exceeding by one-third in quantity and value of its present fruits. The diffusion among the cultivators of the earth of the science belonging to their art would enlighten their minds, enlarge their views, elevate their motives, and refine their sentiments. Let it be remembered, that all this is necessary if we would not see the power residing with them steal away, as has always before been the case, to other classes, whose pursuits secure intellectual cultivation and superior wealth. Agriculture appeals to us as republicans, therefore, with peculiar earnestness, not only by our desire to increase the public wealth, enlarge the public intelligence, and elevate the standard of public virtue; but as we would preserve the ascendency of that policy of peace and improvement identified with the existence of democratic institutions.

"Among the plans of improvement which have been suggested, is the formation of a Board of Agriculture. I respectfully commend it to your favorable attention. Such a board might be usefully employed in introducing new species and varieties of productions, and improvements in implements of husbandry, and in carrying on a general correspondence with a view to promote the interests of agriculture.

I submit also whether it would not be well to require that a popular treatise upon agriculture should be contained in the district school libraries; and whether legislative sanction and patronage could not be so extended as to encourage the organization of agricultural societies, free from the defects which have hitherto proved fatal to their permanency and success."

Prof. Shepherd's Horticultural Address.

We have been kindly furnished with a copy of the address of Prof. Shepherd, delivered before the Horticultural Society of New-Haven in Sept. last, and have read it with great pleasure. It inculcates not only greater attention to the fruit and kitchen garden, as highly conducive to health and comfort, but it urges the culture of flowers, and the planting of ornamental shrubs and trees, as sources of intellectual pleasure, and as means of improving the public taste and promoting rural embellishment.

"The supply of fine vegetables, for the every day supply of the table," the Professor justly remarks, "has not yet received, in our country, all the attention it deserves. The people are every where too much engrossed by what they believe more pressing objects than the raising of vegetables. The farmer is too apt to sacrifice his garden to his staple crops. It is only after his heavy planting is finished, that he finds time to throw in his early crop of garden seeds; and these, when up, receive no care, except at odd moments, and on rainy days. Few vegetables with him, therefore, attain perfection; and these only when circumstances happen to prove propitious. The mechanic, the tradesman, and the professional man of villages and smaller towns, where garden spots are within the means of every person, bestow but little more attention than the farmer upon the culture of vegetables. The kinds produced, the modes of cultivation, and the quantity of supply, each admit of great improvement."

We believe but few persons, who have ever enjoyed the fruits and comforts of a good garden, are willing to forego them, or are apt to remit in their culture. In this respect, a taste for gardening is much like a taste for reading—the more it is cultivated, the more interesting it becomes, the more it grows upon us. The great point, in both, is to begin—to taste,—to realize the pleasures and the profits which they confer. If the farmer, or the village cit, would but *begin*, properly, to cultivate the garden, and persevere through one season, we might count upon his progressive improvement. But if the ground is but half prepared, a circumstance which often occurs, the seeds put in late, and the culture neglected, the product will consequently be trivial, and the quality inferior; and it is no wonder that the owner considers the garden unworthy his care, or meriting only his secondary consideration. In the garden, as on the farm, things should be done in time, and well done—"a stitch in time saves nine:" an *hour* spent in destroying *small* weeds, will often go as far as a *day* spent in destroying *large* ones; and the crop, if timely cleaned and thinned, may give a liberal reward to labor, while if left crowded, and choked with weeds, may fall far short of it. We pledge our belief, that if the farmer of occasional leisure, the mechanic, or the professional gentleman, be he even the clergyman, will spend one half of the time he can spare from his business, in the practical business of the garden, for one season, he will find his health improved, his mind enlarged, and the rational pleasures of life much increased. To the young, a taste for gardening may avert many evils, and lead to much positive good; to the middle aged, it will be a source of high intellectual enjoyment; and to the aged it will afford a healthful exercise to the body, and a pleasant recreation, without alloy, to the mind.

In its bearing upon health, which we all ought to cherish as one of the first blessings of life, the garden and its products, in the opinion of the Professor, have a benign influence.

"It is conceded," says he, "by those who express opinions upon the science of *hygiene* in the United States, that the very free use of animal food is a vice in the dietetics of our people. The fact I hold to be intimately connected with the poverty of our gardens. I do not indeed deny, that our supply of the cerelia is often inadequate; but bread, though called the staff of life, is not intended to be the sole vegetable accompaniment of our meals. Man cannot live by bread alone; and if you deprive him of other varieties of vegetable diet, he will inevitably indulge to excess in the use of animal food. In order to preserve that due adjustment of the vegetable to the animal diet, intended for us by nature, it is not enough to give him, along with the potatoe, an occasional taste of the common sorts of the leguminous and cruciform families of vegetables, but the variety must constantly be rendered as complete as possible, embracing productions the most widely asunder in flavor, as well as in the quality of nutricious matter which they contain."

Perhaps there are no people in the world, who consume so large a proportion of meat with their daily food, as the people of the United States—and very much, we believe, to the prejudice of their health. The mass of the population of Asia, as also of middle Africa, and of middle and southern Europe, subsist almost entirely upon vegetable diet. An erroneous opinion is entertained by many, that a great portion of meat is necessary to the laboring man.—And why? Not because meat affords the most nutriment. According to Vauquelin and other eminent chemists, as quoted in the Encyclopædia Americana, meat contains far less nutriment than many vegetable substances. One hundred pounds of bread is said to contain 80 lbs. of nutritious matter; 100 lbs. of peas 93 of nutrient matter; 100 lbs. of beans 92; and 100 lbs. of meat but 35 lbs. of nutrient matter; while the potatoe affords of nutrient matter 25 per cent. Thus showing that three pounds of potatoes are more nutricious than two pounds of flesh.

The Professor not only complains of the small proportion of vegetable food which we consume, but of the injudicious mode of preparing it for the table.

"Increased attention," says he, "must likewise be devoted to the preparation of vegetables for the table, which subject, I think, comes in (appendix-wise if you please,) among the objects of our society; and particularly recommends itself to the regard of those ladies of the association who occupy the very honorable station of heads of families. Already several delicious vegetables are becoming common in our gardens, which nevertheless but rarely find their way to the table, or when there, are found unpalatable, solely from defective modes of cooking.

"I trust, therefore, that one good result of our society will be the proper regulation of diet; for it appears to me, that well cultivated kitchen gardens and fruit yards are much more likely to effect the object, than the wisest dietetic rules, or the most stirring lectures, in the absence of such necessary provisions."

In speaking of the peach, Prof. S. says, "it is only necessary to plant the trees in a *deep rich soil*, where they will enjoy a shelter from cold winds, and to prune them *annually*, with a *bold hand*, in order to secure a constant and abundant crop." This location for the peach, with us, we should consider a very bad one, as the growth would not cease so early, nor the wood consequently ripen so well before winter, as on a light dry soil, and in a more unprotected situation. Nor can we agree with the Professor in recommending the pruning knife to be used *annually*, and with a *bold hand*, upon standard trees. The branches may be cut in to a thrifty sprout, after having fruited two or three seasons, but we believe the policy of close pruning, and especially of cutting young healthy laterals, has been thought wrong by professional gardners.

In recommending the cultivation of flowers, and ornamental trees and shrubs, Prof. S. pertinently asks—

"Need I speak of the inducement to cultivate such plants within and about our houses! While their delicious odors regale our senses, their form and beauty may be said to improve our taste. The inspection of [exotic] plants, so dissimilar to our native productions, is calculated to awaken in the minds of the young a curiosity in favor of botany; a science whose study has been found to be highly propetitious to early mental culture, —operating as it does to sharpen the habits of observation, to promote discrimination, and to impart, in a remarkable degree, the perception and love of order."

The Professor recommends, particularly, an attention to the domestication and culture of indigenous plants, and ornamental shrubs and trees, of which we can boast of many that are truly beautiful; he enumerates a great number of this description; directs the mode of mixing and grouping them; and recommends planting not only in door-yards, and in streets, but the vacant grounds in the neighborhood of the city. He complains of the neglect of the apple orchards, which have either disappeared, or exhibit a melancholy emblem of neglected old age. Without at all interfering with the temperance cause, the apple orchard is now found to be a valuable appendage to the farm. Giving a succession of fruit during the whole year for the dessert and kitchen, it is capable of contributing largely to the sustenance of the family; while every kind of farm stock, it is now satisfactorily shown, may be fed and fattened upon the fruit with economy and profit.

The Professor dwells with minuteness upon the policy of beautifying the streets and public grounds with ornamental trees, and he forcibly illustrates this policy, by referring to the monuments of past ages—the stately elms which embellish the college green, and which have been the admiration of all strangers who have visited New-Haven. The circumference of some of these trees is said to be from 12 to 18½ feet. One of them was planted by the Rev. James Pierpont in 1688. An interesting fact is also stated, viz: that five generations ago, the parishioners joined their gifts to erect for their pastor a dwelling.—One poor individual, who had no other offering to give, brought from the woods an elm tree, and planted it before the door of the parsonage. The last vestige of the mansion has been devoured by time, and the liberality of those who built it forgotten, while the tree lives and towers in majesty, promising to carry down to other generations the name of William Cooper, the poor man who plucked it from the forest, and planted it where it stands.

Hints for the Master.

Hay that is made in the shade retains its colour and its sweetness much longer than that which is made in the sun, but it requires a longer time to dry. * * * I have found hay which has been made in the shade, after being exposed to the free action of the air for three months, smell as sweet as on the day when the mass from which it was taken was stacked—*Smith on Improved Agriculture.* These remarks go to corroborate what we have often stated, that hay cured in cock, is much superior to that cured by being spread to the sun.

The same writer suggests, that fodder may be greatly augmented by mixing the hay from the field with dry straw in the mow or stack; and that where this is to take place, the hay may be housed much greener than otherwise. The straw is enriched by the surplus juices of the grass. We have practised this with the third cutting of lucerne, and the cattle apparently relished the straw as much as they did the hay.

EXPERIMENTS IN DRYING WHEAT.—"Taking three separate quantities of wheat ears, all of equal weight and cut the same day, the first exposed for seven days to the full influence of the sun, was found to be dry, thin and steely; the second, laid in the shade where the air would have its full effect upon it; this after laying twelve days was rather thin than otherwise, very dry but not steely—its weight was one tenth more than the first;—the third lay very near to the second in the shade, was moistened by having a little water sprinkled over it for the first six days, and then left eight days to dry; it was thin, dry, good body, very mellow, but not quite so bright as the second, although the flour was of quite as good quality, and its weight one-ninth more than the second.—*Smith on Improved Ag.*

The same writer affirms, that if wintered in comfortable warm and dry sheds, cattle will thrive better upon good straw, than those fed upon good hay, in a wet, cold and comfortless yard; that if the straw be cut and mixed with a small quantity of hay, it will all be consumed; and that by these two modes of improvement in feeding, the farmer would be enabled to winter more than twice the quantity of stock, that he can do under present existing circumstances.

OF THE ARRANGEMENT OF FARM LABOR.

The importance of order and system (says Loudon, Enc. Ag. p. 734,) has been already insisted upon, and the subject cannot be too often repeated.—To conduct an extensive farm well, is not a matter of trivial moment, or to the management of which every one is competent. Much may be effected by capital, skill and industry; but even these will not often ensure success without judicious arrangement. With it, a farm furnishes an uninterrupted succession of useful labor during all the seasons of the year; and the most is made that circumstances will admit of, by regularly employing the laboring persons and cattle, at such works as are likely to be most profitable. Under such a system it is hardly to be credited how little time is lost, either of the men or horses, in the course of a whole year. This is the great object, for each horse may be estimated at three shillings (66 cents) per day, and each man at two shillings (44 cents.) Every day, therefore, in which a man and horse are unemployed, occasions the loss of at least five shillings to the husbandman.

As the foundation of a proper arrangement, it is necessary to have a plan of the farm, or at least a list of the fields or parcels into which the land is divided, describing their productive extent, the quality of the soil, the preceding crops, the cultivation given to each, and the species and quantity of manure they have severally received. The future treatment of each field, for a succession of years, may then be resolved on with more probability of success. With the assistance of such a statement, every autumn an arrangement of the crops for the ensuing year ought to be made out; classing the fields or pieces of land, according to the purposes for which they are respectively intended. The number of acres allotted for arable land, meadow or pasture will thus be ascertained. It will not then be difficult to anticipate what number of horses and laborers will be required during the season for the fields in culture, nor the live stock that will be necessary for the pasture land. The works of summer and harvest will likewise be foreseen, and proper hands engaged in due time to perform them.

A farmer should have constantly in view a judicious rotation of crops, according to the nature and quality of his soil, and should arrange the quantity and succession of labor accordingly. Farm labor, when frosts and bad weather do not intervene, should be arranged for some months; and hand labor for some weeks, according to the season of the year.—"A general memorandum list of business to be done," may therefore be useful, that nothing may escape the memory, and that the most requisite work may be brought forward first, if suitable to the state of the weather. In this way the labor will go on regularly, and without confusion, while by a proper attention, either a distribution of labor, or an occasional consolidation of it, may be applied to every part of the farm.

The farmer ought to rise early, and see that others do so. In the winter season, breakfast should be taken by candle light, for by this means an hour is gained, which many farmers indolently lose; though six hours in a week are nearly equal to the working part of a winter day. This is a material object where a number of persons are employed. It is also particularly necessary for farmers to insist on the punctual performance of their orders.

The whole farm should be regularly inspected, and not only every field examined but every beast seen, at least once a day, either by the occupier or some intelligent servant.

In a considerable farm, it is of the utmost consequence to have servants specially appropriated for each of the most important departments of labor; for there is often a great loss of time where persons are frequently changing their employments. Besides, where the division of labor is introduced, work is executed not only more expeditiously, but also much better, in consequence of the same hands being constantly employed in one particular department.

Previously to engaging in a work, whether of ordinary practice or of intended improvement, the best consideration of which the farmer is capable, ought to be given to it, till he is satisfied that it is advisable for him to attempt it. When begun, he ought to proceed in it with much perseverance and attention, until he has given it a fair trial. It is a main object, in carrying on improvements, not to attempt too much at once; and never to begin a work without a probability of being able to finish it in due season.

By the adoption of these rules, every farmer will be master of his time, so that every thing required to be done, will be performed at the proper moment, and not be delayed till the season and opportunity have been lost. The impediments arising from bad weather, sick servants, or the occasional and necessary absence of the master, will, in that case, be of little consequence, nor embarrass the operations to be carried on; and the occupier will not be prevented from attending to the smallest concerns connected with his business, on the aggregate of which his prosperity depends.

OF DOMESTIC MANAGEMENT AND PERSONAL EXPENSES.

On domestic affairs, a hint may suffice. Young farmers beginning house-keeping, like most others in similar circumstances, are apt to sink too great a proportion of their capital in furniture, and furnishing riding horses, carriages, &c. and sometimes to live up to, and even beyond, their income. We do not mean that farmers should not live like other men of the same property, but merely that all beginners should live within their income. Even in the marketing expenses care is requisite; and the prudent farmer will do well, every penny or six-pence he lays out, to reckon up in his mind what that sum per day would come to in a year. The amount will often astonish him, and lead to economy, and, when practicable, to retrenchment. Saving, as Franklin has inculcated, is the only way of accumulating money.

In regard to house-keeping, it is observed in the *Code of Agriculture*, that the safest plan is, not to suffer it to exceed a certain sum for bought articles weekly. An annual sum should be allotted for clothing, and the personal expenses of the farmer, his wife and children, which ought not to be exceeded. The whole allotted expense should be considerably within the probable receipts, and if possible one-eighth of the income annually received, should be laid up for contingences or expended in extra improvements upon the farm.—*Enc. Ag.*

Pyramids of Butter.

Col. Meacham, of Oswego county, lately brought to this city, two pyramids of butter, the produce of his dairy, one weighing five hundred pounds, and the other nine hundred pounds. They were covered with fine white cloth, upon which were various devices and inscriptions. The Colonel had previously sent to Washington a *tub* of butter, weighing 1450 lbs! Col. Meacham's name was already favorably known to the public as the maker of the large cheeses which attracted much notice two or three years ago. But it is not the production of large cheeses, or pyramids of butter, alone, that gives to this worthy citizen a high rank for enterprise and usefulness. Col. M. is a self-educated, self-made man, and one of the best farmers in our state. His example has had a highly salutary influence upon all around him, and has tended materially to increase the products, and to enhance the value of the lands in his neighborhood, and to check, withal, the tide of emigration from thence to the far west. How highly should such a citizen be appreciated, who not only contributes largely himself by his industry and enterprise, to the public prosperity, but influences others, by his example and his counsel, to "follow in his footsteps."

Rearing of Cattle.

We would direct the attention of our farmers particularly to this branch of husbandry, as one that promises to be lucrative in more ways than one.—The scarcety of winter fodder for some years back, induced many farmers greatly to reduce their farm stock. The high prices which beef has commanded in our cities and towns, has been a further cause of the reduction of our farm stock. But there is another cause, of no inconsiderable magnitude, completely under the farmer's control, which good policy, and even humanity, imperiously require should be corrected. We allude to the practice among dairymen, of destroying their calves at two or three days old, *to save the milk* which they would require, if suffered to live. This has become an alarming, and is a growing evil, in our state, and unless it is abated, threatens the worst consequences. Thousands of calves are thus annually destroyed, we are told, in the dairy districts, from a short-sighted policy, which would sacrifice, to present gain, one of the most important branches of our husbandry. These causes, combined, have caused a comparative scarcity of neat cattle; and prices have consequently advanced fifty to one hundred per cent, until this branch of husbandry, especially since the wheat crop, from the effects of winter and the depredations of insect enemies, has become precarious,—until, we say, cattle husbandry has become the most certain, and we believe the most profitable branch of farming.

But it is not the price of cattle alone that should influence the farmer in this matter. To *keep up the fertility of the soil*, is the cardinal point in good farming. *Fertility* is the source of our profits; and the *interest* which we receive will ever be regulated by the amount of the *capital* from which it accrues.—Cattle are emphatically the cause of fertility. They manufacture the hay, the straw, the stalks, the roots, &c. of the farm into dung, and dung alone keeps up fertility. The more cattle, therefore, which are maintained upon the produce of the farm, the greater the ability to keep up its fertility—the greater the farmer's fund, and the greater the amount of produce, or of interest, which he draws from it.

We know that there are many persons who own rich new lands, who either do not believe in, or who do not practice upon, this doctrine. They say fertility is inexhaustible in their soils; and practising upon this theory, they have in a measure neglected farm stock, and directed their whole efforts to the exhausting culture of wheat. We tell them, that the first settlers in the valleys of the Hudson and Mohawk once held their doctrine, and practised upon it, till their sons have seen its fallacy, to their sorrow; and have been obliged to commence an expensive renovating process, and a more enlightened system of management, to repair the waste, and atone for the errors, of their ancestors.

Corn Stock Fodder

Is generally regarded, by northern farmers, as of secondary, or trivial importance, in the economy of feeding neat cattle; and in the usual way of harvesting, curing and feeding it, perhaps the opinion is pretty well founded. The mode of harvesting is either to top and leave the tops in the field till the corn is gathered, or to gather tops and buts, after the corn harvest. In the first mode, the tops are always laid upon the ground, exposed to all the vicissitudes of weather, for days, and perhaps for weeks. They are then bound and stooked till gathered to the barn or fodder yard, probably in Oct. or Nov. at which time those cut up after the corn is picked, are generally also brought it. Thus, after attaining to maturity, to their best condition as cattle fodder, they are exposed, for one or two months, to the scorching and deteriorating influence of the sun, winds and rain, till their nutritive properties are seriously diminished, and until a considerable portion is either spoiled or wasted. And finally, they are often pulled from the stack by the stock which have admission to them, or fed, uncut, in a dirty yard, and soon trampled under foot. Now we ask any farmer of common sense, what his hay would be worth under a like system of management? Exposed for weeks or months to the wasting influence of the weather, afterwards but badly protected, and finally fed to his cattle in a like reckless and slovenly way!—Would it not impair it half—two-thirds, of its value? Sugar, or its elements, constitute the great nutritive principle of cattle forage. This exists to a great extent in corn stalks, as is evidenced by the saccharine matter perceptible in chewing a piece of green stalk, but it is more fully demonstrated by the fact, that in our revolutionary war, molasses, for household use, was manufactured from the stalks of corn, in mills constructed for the purpose. All our hay grasses possess this nutrient property. The moment cattle forage is cut, be it grass or corn-stalks, the natural tendency is to decomposition—to separate into elementary principles—and heat, moisture and air being the agents in effecting this change—the change is accellerated in proportion as these agents are permitted to operate upon the vegetable mass. If exposed to them all, as in the meadow or corn field, the change is rapid, and the hay or straw consequently more decreased in value; but if partially or wholly protected from one or more, by being secured in stooks, cocks, stacks, or buildings, the tendency to change—to rot,—is either retarded or wholly suspended. We all know, that to expose hay for weeks, or for days, to the combined influence of these agents, is destructive to its good qualities. Precisely such, though perhaps in a diminished degree, is their influence upon corn-stalk fodder.

Let us then inquire, what mode we can adopt to secure the full advantage of this great auxiliary to the cattle yard. Fortunately the mode has already been suggested by intelligent minds, and its utility amply demonstrated in the practice of many of our best farmers. The mode of doing the thing is this:—cut at the ground the corn crop, as soon as the grain has become glazed, and while the stock is surcharged with saccharine nutricious juices; put it immediately into stooks, containing 20 to 25 hills each; secure these well with a band above the ears, and another on the bonnet, to exclude rain; as soon as the corn is gathered, which may be done in ten to fourteen days, bind and stook the stalks, and as soon as they are sufficiently cured, carry them to the barn or sheds, or secure them in stacks; and when wanted, cut them with a machine, and feed them to your cattle in a clean manger. Thus cured and thus fed, corn stalks are equal, if not superior, to hay, for the winter keep of neat cattle. In saying this, we speak from the personal experience of years—our neat cattle have been wintered,—and *well* wintered, upon them, several years; and we are happy to add, in another column of this day's Cultivator, the corroborating and unequivocal testimony of Mr. Foote, of Williamstown, in favor of the system.

There is another and important consideration we have to mention, and that is, a belief, that well cured corn-stalks constitute an excellent food, when cut, for horses. At the south, corn blades, we believe, are almost exclusively used for the winter keep of horses. During last summer, it was mentioned by a correspondent on Long-Island, that corn stalk fodder was an effectual remedy against that troublesome disease—the *heaves*. Our hack horse had for years been troubled with this disease, and it never appeared to be more oppressive to the poor animal than in October last. As soon as our stalks were gathered to the barn, we directed some to be cut and fed to him, and the practice has been kept up to this day. We will not say that this has cured him; but this we do say, that since he has been served with the corn-stalks, we have not discovered in him the least indication of the disorder.

Cultivator Premiums.

There are but three crops, two of Indian Corn and one of Ruta Baga, that have claims to the premiums offered by us in our March number; and all these, we are happy to say, are highly deserving of reward.

The estimated nett profits of these crops are $68.15, $87.71, and $134.50—products large enough, certainly, to satisfy the reasonable desires of any man, for the use, one year, of an acre of land—and probably exceeding its marketable price, in fee. The only fault we find with the accounts current of these crops, is the low estimates they make of the value of manure; and one gentleman, Mr. Osborn, has virtually considered it worth nothing, except the expense of hauling it out. These gentlemen must all be good farmers, and if so, they must know, that every load of manure, when judiciously applied to the corn or ruta baga crop, is richly worth one dollar—nay, that it adds two dollars to the value of the crop.

Of the corn crops, both are so meritorious to the cultivators, that we will not stop to inquire which is most so, but cheerfully award to each of the competitors a *first* premium.

The ruta baga crop is certainly highly meritorious, whether we regard the product or the example it holds out to others. We therefore award—

To William Ingalls, of Volney, and to Joseph F. Osborn, of Port Byron, each, a ten dollar premium, on their corn crops of 116 and 118¼ bushels per acre. And

To John C. Mather, of Schaghticoke, a premium of ten dollars, on his crop of 1231 bushels of ruta baga to the acre.

The premiums will be paid in plate, on demand, in such articles as the claimants may select. And may these prizes, though small in amount, stimulate the gentlemen to whom they are awarded to persevere in the work of improvement and of usefulness, to their individual benefit, and to the manifest advantage of the public, through their excellent example.

We award the premium of five dollars, for the best plan of a barn and cattle sheds, offered in 1837, to C. N. Bement, of Albany.

On the Culture of Rape.

Our attention has been drawn to this plant by the letter of Mr. Kennedy, inserted under Correspondence; and from the experiment in its culture which he details, there is a strong probability that it may be profitably introduced among us as a farm crop.

Rape belongs to the *Brassica*, or Cabbage, genus of plants, and is cultivated extensively on the continent, and in some parts of Britain, principally for the oil afforded by its seeds. According to De Candolle and Von Thaer, the species cultivated in Germany, France and the Netherlands, is the *Brassica campestris oleifera*, while that cultivated in Britain is the *Brassica napus*. The former has hispid, or bristly leaves, is more hardy, and more productive than the latter, the product being 955 to 700 of the latter. The rape is a biennial plant, and perfectly hardy, we *now* believe, in our climate.

With a view to encourage experiments in the culture of this plant, we shall state somewhat in detail, the mode of managing the crop, its product, uses, &c.

The soil for rape should in the first place be dry—it should be rich, ploughed deep and well pulverized. Reclaimed swamps suit it well. Prepare as for turnips, or other fine seed. The seed may be sown at the same time as the common turnip, and indeed it is sometimes sown with the turnip, though the practice is a bad one—the turnips being gathered in the autumn, and the rape in July following, when the seed has attained to maturity. It may be sown broadcast or in drills. If intended to be fed off by sheep in winter, a practice recommended by Loudon, and followed in Lincolnshire, one peck of seed may be evenly sown broadcast upon an acre; but if the object is seed, or the drill culture is to be adopted, two to four quarts of seed will suffice for an acre. Resembling the turnip much in the properties of its top, it affords, in autumn and winter, a fine "bite" for sheep. It is scarcely surpassed, says Loudon, by any other vegetable, in so far as respects its nutritious properties, and that of being agreeable to the taste of the animals. The after culture of rape should be like that of the turnip, though we are afraid it would be apt to be neglected with us—that is, it ought to be kept free from weeds by the hoe, and the plants ought to be thinned to the distance of six inches.—In close crops the seed is only found on the summits of the plants; in wide ones it also covers their sides. As seed is the principal object, the thinning process should be particularly attended to. It comes to maturity in July or August.

The harvesting process is the most critical. The crop must be cut with a sickle or hook, and with care, to prevent the loss of seed, which wastes under careless management; and it should be threshed, in the field or barn without delay, and without being put into stack or mow. In moving it to the threshing floor, either a perfectly tight box to the wagon or cart is required, or a large cloth should be spread upon the bottom, and extended over the sides, so as to catch all the seeds that fall out. The harvesting should be made in good weather, and as many hands be employed as can work to profit.

The product, under favorable circumstances, is forty or fifty bushels, or more, of seed to the acre.—The seed is crushed for oil, in the same way as lint or flaxseed, and never sells for less, in England than £30, the last of ten quarters, which is about $1.66 to $1.70 the bushel. Marshall says it may be considered as one of the most profitable crops in husbandry. There have been, says he, instances, on cold unproductive old pasture lands, in which the produce of the rape crop has been equal to the purchase value of the lands. The oil is burnt in lamps, and is used for various other purposes; but is liable to become rancid; but by being purified it is almost entirely divested of color, smell and taste, so that it will burn clear without any interruption.

Independent of the value of the seed for oil, and of the leaves as winter food for sheep, the rape crop affords other sources of profit. Rape cake constitutes a valuable material for manure. The English break it into powder, and sow it broadcast upon clover, or deposite it, at the rate of four cwt. to an acre, in drills with turnip seed. The Flemings throw it into their urine cisterns, where it dissolves, and adds materially to the fertilizing properties of the liquid. In Holland it is almost exclusively used for feeding milch cows and other farm stock; and, if we mistake not, quantities are annually exported to England, under the name of oil cake, for a like purpose. The haulm is burnt by the Flemings, and the ashes, which are alledged to be equal to potash, are employed as manure. The English condemn this practice, and say that the haulm or straw is as acceptable to cattle as hay; and the Lincolnshire corrected report adds, that when grown on fresh land, the stalk is as brittle as glass, and is superior to every other kind of food in fattening sheep.

Rape has been raised, on a limited scale, by some foreign emigrants in our neighborhood, to afford autumn feed for sheep, but never, as we can learn, for the seed. And indeed seed has been kindly sent to us for trial, but the multiplicity of our avocations have prevented our giving it a trial. A principal obstacle, at present, to its culture among us, would be the want of mills to crush the seed.

We tender our thanks to Mr. Kennedy, for calling our attention to the subject; and shall be happy to be advised of the further progress of the culture in his neighborhood.

The Calendar of Flora.

The following memoranda of the time of the flowering of the peach and apple, will show the comparative forwardness of the spring season at the different places noted, the latitudes of which are also noted. The data were collected by Prof. Bigelow, of Harvard College. The peach blossoms at all places, according to Humboldt, in the month when the mean heat is about 42° of Fahrenheit.

Places.	*N. Lat.*	*Peach.*	*Apple.*
Charleston, S. C.	32°44'	March 6 to 12.	April 4.
Richmond, Va.	37.40	Mar. 6 to Ap. 6.	April 10–18.
Lexington, Ky.	38. 6	April 6 to 15.	April 10.
Baltimore, Md.	31.21	April 9	April 14.
Philadelphia, Pa.	39.56	April 15	April 20.
New-York,	40.42	April 21–26	May 4.
Boston,	42.23	May 9	May 18.
Albany,	42.39	May 12	May 15.
Montreal, L. C.	45.35	May 12	May 25.
Brunswick Me.			May 29.

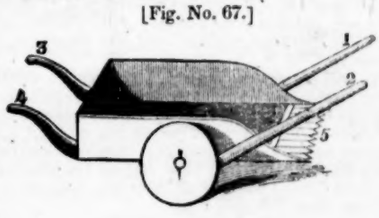
It appears from calendars of flowering in Europe, that in the average, vegetation is about a month backwarder in the United States, than in the same parallels of latitude in Europe. It appears from the above, also, that there is a difference in the forwardness of vegetation between Charleston and Albany, in a distance of nearly ten degrees of latitude, of about two months, or sixty days—averaging about six days to every degree. It is to be remarked that all the observations were made upon tide-water, except the one in Kentucky; and that every 300 feet of elevation above tide-water, in the same parallel of latitude, is equal to a degree, in the backwardness of vegetation. Thus the season at Albany would be six days earlier than at 300 feet elevation upon the neighboring Hellebergh, and 12 days earlier than at 600 feet elevation.

Clover and Clover Seed.

Clover is becoming of more and more importance, and the quantity sown is annually increasing, in proportion as the new system of husbandry progresses among us. Its tap roots penetrate and loosen the soil; its stems and foliage produce abundance of nutricious food for the neat stock of the farm; and both roots and stems, when turned over by the plough, are highly enriching to the soil. It is indispensable in alternate husbandry; and we feel justified in saying, that its liberal and judicious use, together with gypsum, upon many light soils, have added fifty, one hundred, and even two hundred per cent, to the profits of their culture. Yet there are a great many districts of our country in which its value is seemingly but little appreciated, and in which its cultivation has yet hardly been begun. There is hardly a plant grown upon the farm that returns to the soil more of the elements of fertility. There is almost a certainty, that its culture will continue to increase for some years, in a progressive ratio.

From this view of the subject it is apparent, that clover seed will continue to increase in demand, as it has continued to increase in price; and that the raising of it for market promises to be a lucrative business. The dwarf southern clover will afford a crop of hay, to be cut the last of June, and a crop of seed, to be gathered towards autumn. The price of seed is now from twelve to fifteen dollars a bushel; and suppose the acre to yield but five bushels, the profit will be enormous. Machines for cleaning the seed are already abundant, and others have been introduced for gathering the heads in the field. We give below the drawing and dimensions of one described by Mr. L'Hommedieu, in the transactions of the old Agricultural Society.

[Fig. No. 67.]



DIMENSIONS.

1. 2. The shafts, 4 feet 4 inches long, and three feet asunder.

3. 4. The handles, 3 feet long and 20 inches apart.

5. The fingers or teeth, 13 inches long.

The wheels are sixteen inches in diameter.

The machine is drawn by one horse, and guided by a man or boy. It simply consists of an open box, about 4 feet square at the bottom, and about three in height, on three sides. To the fore part, which is open, fingers are fixed, similar to those of a cradle, about thirteen inches in length, and so near as to break off the heads from the clover stocks between them, which are thrown back into the box as the horse advances. The box is fixed on an axeltree, supported by the wheels. The driver raises or lowers the fingers of the machine, so as to take off all the heads of the grass; and, as often as the box is filled with them, they are thrown out, and the horse goes on as before.

Specific Manures.

We have said, and repeated, that wheat cannot be depended on as a profitable crop, on primitive soils, without the application of animal matters and lime. The hopes of making New-England a wheat-growing country, always seem to us fallacious, from the absence, in all primitive formations, of these two essential elements, lime and animal matter. Lime is now generally admitted to be essential to a wheat soil; but as lime consists of 20 parts of the metal *calcium*, and about 7.5 of oxygen, it does not seem to furnish nitrogen. Upon this subject, we quote from the Edinburgh Quarterly Journal of Agriculture, the following, in support of our former opinions.

"On analyzing the *grain* of wheat, and the *bulb* of the turnip, (the parts for which the crops are cultivated,) it is at once found that both of them contain *elementary* principles not entering into the composition of "*common vegetable matter*," namely, *nitrogen* in the grain of the wheat, and *sulphur* in the turnip, beside which the *saline* matter is also found to be peculiar, but this last will be considered more fully hereafter. Having once, therefore, discovered that these elements are essentially necessary for the growth of the above-mentioned plants, we are evidently led to ask ourselves the question, Whence are they to be obtained? Dear bought experience has long since answered, *in animal manures*. Yes, all substances derived from the animal kingdom contain more or less of both nitrogen and sulphur, and hence the value, or, in fact, the absolute *necessity*, of such manures for the particular crops now under consideration. It may, indeed, be said by some, that 'however necessary animal manure may be for turnips, still there can be no absolute necessity for their application to the wheat crop, for, as nitrogen is the substance here wanted, surely the atmosphere will present a ready and never-failing reservoir of that element.' But it must here be remarked, in answer to such a statement, that it is exceedingly probable that the *higher* order of plants, at least, *never* obtain the nitrogen they possess from the air, but always from decomposing *animal* matter."

And what, we may be asked, are *animal manures*? Not mere vegetables, which have rotted in the yard, or passed through the cattle of the farm—not farmyard and stable dung, in the ordinary mode of its

management. The common vegetable matters consumed by the farm-stock do not contain nitrogen, this essential element of wheat. It, however, abounds in the urine of animals, and in all animal substances, as wool, hair, bone, horn, the dung of carniverous animals, or such as feed upon flesh; it exists in fish, in soap boilers' waste, impregnated with animal oil, and to some extent in shell marls.

We shall be told, probably, in contradiction to our theory, that the primitive formation of New-England has produced good wheat, and that it promises to produce it again. When first subjected to culture, even, soils of primitive formation have a quantity of animal matters upon their surface, the accumulation of centuries, which may have sufficed for one or more crops of wheat; but these supplies being exhausted, the crop has failed. Art may in many cases supply the deficiency, by the application to the soil of one or more of the above enumerated animal substances; and these elementary matters may have been accumulating from ordinary manuring, until the soil has become sufficiently charged with the specific food of a wheat crop. We really fear that all attempts to raise good wheat—we mean the grain, not the straw—on soils of primitive formation, without the aid of animal manures, will be found to be rather an uphill business; and that even with this aid, it will turn out much like Franklin's whistle—will cost more than it is worth.

We will extract one other remark from the writer above quoted—which is, that "although *practice* has long ago shown the necessity of *animal* manures for the above-mentioned crops, [wheat and turnips,] still *chemical analysis* alone could ever have explained the *reason* for this necessity; thus placing the advantages to be derived from the science in a truly prominent and important light."

Properties of Wheat.

The following abstract is taken from Davy, to show, first, the difference in gluten, starch and bran, between winter and spring wheat; and, secondly, how seriously impaired the value of both is by mildew.

		Flour.	*Bran.*
Thin-skinned Sicilian wheat afforded of..	Gluten 239, Starch 722	=961	39
Middlesex wheat, (average crop,)	Gluten 190, Starch 765	=955	45
Spring wheat,.....	Gluten 240, Starch 700	=940	60
Mildewed wheat of 1801	Gluten 130, Starch 520	=650	350
Do. of 1806, ...	Gluten 32, Starch 178	=210	790

Showing, in one instance, a loss of 31 per cent of flour in the mildewed, when compared with the average English wheat, and in the other of nearly 75 per cent.

It will be perceived that the spring wheat contained more gluten, the more nutritious portion of flour, than the winter wheat; and that the winter wheat from Sicily, a warm climate, contained a greater portion of gluten than that which was raised in England, a cool climate.

Education in the German States.

Some time ago, the Conductor received from the author, a pamphlet "On the establishments for public education in Bavaria, Wirtemburgh and Baden, &c. by John C. Loudon," editor of the Encyclopædia of Agriculture, &c. There are many facts embraced in the pamphlet, from which we may derive benefit, particularly from those which relate to new branches of instruction, which may properly and profitably be introduced into our common schools.

The kingdom of Wirtemburgh is represented as one of the most generally civilized in Europe. Elementary education is universally diffused. All can read and write. Schools are of course abundant. A college is established for the instruction of school teachers. The students undergo a rigid examination, and when properly qualified as teachers, they receive a certificate, which is indispensable to admit them to the head of the lowest school. Government fixes the amount of their salary, which is paid by a tax on the district.

Every child is required to be sent to school—males from 6 to 15—females from 6 to 13. An annual examination is had, at which the trustees award a certificate to those who are found to be competently instructed; and no person is allowed to be employed throughout the kingdom, who is under the age of 21, without such certificate.

In Bavaria, the system of education resembles that of Wirtemburgh. The elementary principles of agriculture, both the art and science, are taught in these schools. M. Hazzi, an enlightened patriot, has composed a Catechism of Agriculture, which the government has ordered to be introduced into all the schools. Every school has some two or three acres of land annexed to it, in which the scholars act as laborers—sowing various kinds of seeds—noticing the variety of culture, and the phenomena of vegetable physiology. A small garden is reserved for the female children to raise flowers. The elder scholars in the female academy at Carlshue study natural history, (and particularly botany,) astronomy, geography, the French and German languages, and music and drawing.

On the Winter Management of Manure

We make this preliminary remark, upon which what we have to offer is in a measure predicated, viz. that all the manure from the stables, yard and hog-pen, should be carried out in the spring, for the corn and potato crops.

The objects to be obtained in the winter management of manure, are,

1. To prevent waste by leeching and drainage;
2. To prevent its becoming fire-fanged; and,
3. To prevent more than moderate, or incipient, fermentation.

1. Where cattle yards are upon a slope, or are convex, or nearly upon a level surface, the liquid portions of the manure, which may be termed in a measure the cooked food of plants, continually pass off, and are lost. Heavy rains, and the drip from the barns and sheds, also, passing through the manure, in its escape from the yard, leech, and deprive it of its finest and most fertilizing properties.

The remedies against this evil, consist, *first*, in giving a concave, or dishing shape to the yard. The earth excavated from the centre being deposited upon the borders, which should be fifteen or twenty feet broad, with a slight inclination to the centre, a dry passage to the barn is secured, and a sufficient space of dry ground to feed the stock upon which run at large. *Secondly*, the yard should be bedded, after it is cleaned, with peat or swamp earth, if the farm affords it, six to twelve inches deep; or if this is not to be had, with any other porous waste earth—and afterwards should be kept well littered with straw, stalks, potato tops, and the coarse grass and weeds of the farm. The shape of the yard prevents the escape of the liquids, and the earth and litter absorb and become enriched by them. Even should the liquids of the yard be dried up, as they are in summer, the earth and litter will retain the fertilizing matters which they held in solution. By these operations alone, the quantity of manure will be double what it is where they are neglected. *Thirdly*, in endeavouring to prevent an excess of water in the yard, by catching in gutters, and conducting off, what falls from the buildings. And *fourthly*, by constructing a reservoir, under ground, for the reception of the liquids that unavoidably flow from the yard, and particularly for the urine from the stables. In this latter mode, a great accession may be made to the fertilizing resources of a farm, and a material obtained, fitted for the immediate wants of a growing crop.

2. When dung is accumulated in large masses, either when thrown from the stables, or in the fields where it is to be applied, even if protected from the weather, a violent fermentation takes place, moisture is exhausted from the mass, and the dung becomes what is termed *fire-fanged*—dry, light and mouldy, and seriously impaired in its value.

To avoid this, in the yard, spread the manure from the stable, occasionally, over the yard. It thereby becomes blended with other matters less disposed to ferment, is trodden by the stock, and the air, one of the agents in causing it to ferment, is in a measure excluded. Under cover, it should not be suffered to accumulate in excess, without the admixture of earthy matters, which would retard fermentation and preserve moisture. It is often convenient to draw manure to the field in the autumn, or winter, where it is to be used. If such manure has not undergone fermentation, it should never be laid in heaps of more than three feet in depth, or six or eight loads together, the surface should be handsomely smoothed off, and then covered, when the frost will permit, with six or eight inches of sod or earth. This prevents violent fermentation, and the loss of the gaseous matters which fermentation always sends off.

With the foregoing precautions, there is little danger of fermentation proceeding to a wasteful or improper length before the manure is wanted for the corn or potato crop.

What farmer is there, who makes any pretentions to economy, who would not feel insulted to be told, that he carelessly wasted one half of his family food, or of his cattle food—one half of what his farm produced for animal subsistence? Where is the matter of difference, whether he wastes the food of his family, of his animals, or of his crops? His crops feed both his family and his live stock; and unless he feeds his crops, the others must ultimately suffer the penalty—for the earth, though a kind and prolific mother, cannot always give, when we withhold from her the means of giving. Return to her *what is no longer of use to us*, and she will requite us with her richest blessings. Let us bear in mind, that every animal and vegetable substance, which we return to her bosom, she will faithfully elaborate into new organized matter, for our pleasure and profit; but that if, like the prodigal, we exhaust the parental treasure, it can no longer supply us with bread or meat. Too many who occupy a rich virgin soil, may be likened to useless drones who waste their patrimonial wealth: they waste that which would benefit both themselves and their children.

The Oak the Emblem of our Country.

Our country may be likened to the oak—the three great business classes to the roots, branches and leaves, and the strong tough trunk, to society in mass. Agriculture may be compared to the roots, which provide food and the elements of wealth; manufactures to the leaves, which elaborate, and convert to useful purposes, the materials furnished by the roots—and commerce, to the branches, or channel of intercourse between the roots and the leaves. Without the branches, the roots and leaves are deprived of their reciprocal aids. Without the leaves, growth must cease. Without the roots, leaves, branches and trunk must perish. The root can send forth a new stem, branches and leaves; but neither the stem nor branches, nor leaves can, ordinarily, either separately or conjunctively, produce new roots. All are, primarily, nourished from the soil, and all being in healthful condition, form a whole, which can, like the oak, buffit the storm, be it the local thunder gust, or the more formidable foreign north easter. Let us, therefore, cherish and protect all—and let us specially nurture the root, as the primary source of life, growth and usefulness, to the stem, branches and leaves. To carry out the comparison, we will liken the acorns to the "loaves and fishes" of office, and the moss, which feeds upon the oak, to the parasytic drones who live upon society. N. B. In our comparison of the farmers to the radicles of the oak, we beg not to be misunderstood—they are not radicals *politically*, but the radicles *positively*.

Resources of Fertility in the South.

Throughout the entire oceanic deposite, from Connecticut to the Capes of Florida, or what may be called the flat sandy districts on the Atlantic border, new elements of fertility are daily being brought to light, and this will undoubtedly continue to be the case for years, as science is made more and more subservient to the purposes of husbandry. So that it would seem, that Providence has every where scattered the means, if man will but properly use them, of rendering the soil prolific, in all that is essential to the wants and comforts of the human family. The green sands of New-Jersey, Maryland and Virginia, abounding in potash, have already done wonders in imparting fertility to soils that were deemed barren and unworthy of culture; the shell marls, and immense banks of marine shells, which seem to increase in magnitude as we go south, are coming into useful action, chiefly through the instrumentality of E. Ruffin, whose excellent treatise upon calcarious manures ought to be in the hands of every farmer; and we see recently announced the discovery, by Dr. Cooper, of immense beds of calcarious matters, of uncommon richness, in the pine or sandy districts of South Carolina—a material exactly adapted to the wants of those districts. We have in our own state immense beds of marl, fitted to impart fertility to our soils, yet but imperfectly known, and less properly appreciated in value.

National Silk Convention.

A convention of 170 gentlemen, engaged in the silk and mulberry business, met at Baltimore on the 12th Dec. and held a session of three days, and formed the "American Silk Society." It was resolved in these meetings, to establish a national Silk Journal; to recommend the organization of state societies, auxiliary to the national society; to offer premiums to encourage the culture and manufacture of silk; to recommend the Piedmont silk reel; to recommend to the cultivators of the mulberry, *to turn their attention to the production of silk;* to solicit the states to pass laws to encourage the silk culture, and to protect plantations of the mulberry; and that another national Silk Convention be held at Washington, on the second Wednesday after the first Monday in Dec. next.

The Grain Worm,

Which is complained of in the west, and which has been particularly spoken of in the Genesee Farmer, we are induced to believe, is not identical with the insect which has for years devastated our fields. Will the editor of that Journal, or some other individual, describe the grain-worm of the west?

Boynton's Straw-Cutter.—This recently patented machine, of which a figure, &c. is given in our advertising sheet, is highly spoken of; but we are unable to speak personally of its merits, not having seen it in operation, or even seen the machine.

Root Culture.

Persuaded that root culture is ultimately to effect a great improvement in our husbandry, we propose to make it the subject of some remarks in this and subsequent numbers. The advantages which root crops offer to the farmer, are the following, viz.—they furnish the most food for animals, and the most food for vegetables in the form of dung; they are least exhausting to the soil, which they serve to divide and pulverize; they are excellent to alternate with grass and grain in convertible husbandry; and for these reasons they are the most profitable to the cultivator, on all farms which will admit of their culture. We intend to direct the attention of the reader to the different roots which are adapted to our field culture, to the best modes of managing the crops, the manner of preserving and feeding them properly, the expense of culture, the average product, and, so far as our data will justify, state their relative value as cattle food.

The roots we intend to notice are, the Potato, the Turnip, the Beet, the Carrot and the Parsnip. But before we proceed to consider them individually, we will offer some

PRELIMINARY REMARKS.

Five things are essential in the culture of the roots we have named: 1st. A dry soil; 2d. A rich soil; 3d. A deep worked soil; 4th. A well pulverized soil; and 5th. Good after culture. The crop will be abundant in proportion as these several requisites are present, and defective in proportion as they fail.

By a *dry* soil, we mean a soil that is not *wet*.—*Moisture* is beneficial to all crops, but *water* is detrimental to all root crops, though it repose upon the subsoil, or but occasionally saturate the surface.—Hence where roots are grown upon soils that are tenacious and flat, or upon those which repose upon an impervious subsoil, the land should be thrown into ridges, and the furrows kept open for the free passage of the water in heavy rains.

A rich soil is as essential to good crops as rich and abundant food is to the fattening of farm stock. We all know that short pasture and coarse fodder will *keep* cattle, though it will not *fatten* them. So with roots—they will *live* and *grow* upon a poor soil, but their product and profit will be great only on a *rich* one. The advantage to the crop, as well as the animal, will be in proportion to the quantity of dead organic matter which it converts into living organic matter—into vegetables and into meat. Ordinarily speaking, a good dressing of manure will double the products of a root crop. To illustrate this fact more fully, we abstract the following tabular statement from Arthur Young's experiments in planting potatoes. The preparation and culture were alike in all. The numbers to which the asterisk (*) is affixed were manured crops.

No.	Preceding crops.	Expense. £ s. d.	Product, bushels.	Profit. £ s. d.	Loss s. d.
1	Fallow, ...	3 19 1	104 at 1s.6d	2 18 5	0 0
2	Barley, ...	4 5 9	128 2 0	3 11 10	0 0
3	Wheat, ...	6 13 6	46 0 20	0 0 0	0 0
4*	Do	7 16 10	101 0 20	2 5 6	0 0
5	Do	6 2 6	39 0 20	0 7 6	0 0
6	Do	7 19 4	63 0 20	0 16 11	0 0
7*	Do	4 14 5	170 0 20	9 2 0	0 0
8	Do	8 9 3	30 0 20	0 0 0	15 6
9*	Do	4 12 1	201 0 20	11 2 9	0 0

The three manured crops, it will be seen, gave an aggregate product of 472 bushels, and an aggregate nett profit of £22.10.3, ($99.90, say $100;) the three adjoining plats, treated like the others in all respects but manuring, gave an aggregate nett product of but 132 bushels, and an aggregate nett profit of but 8s. 11d. ($1.96, say $2;) thus showing that the manure, in these cases, caused an absolute gain of $98, and that where it was not used, there was in fact only a nominal profit of *two dollars!* These facts will serve to show the reader, *first*, the great value of manure in farming operations, and to stimulate him to save and economise it; and, *secondly*, to show him the propriety of *always* manuring his potato crop, for which it is universally admitted the unfermented dung and litter of his cattle yard is *best* fitted.

A deep worked soil is necessary, that the tap roots of the beet, carrot and parsnip may not only penetrate freely, and enlarge their length and volume, but that their radicles, which are principally upon their lower extremities, may there find food for the plant. The fibrous roots of the potato and the turnip are equally benefitted by a deep tilth, from which they can draw nourishment, and find shelter from drought.

The pulverization of the soil is essential to the germination of the seed, to the easy extension of the roots, and to the free circulation of air and moisture, and the admission of solar heat, all necessary to prepare and transmit the food to the growing plants.

Thinning the plants and keeping them free from weeds, and the surface of the soil open to atmospheric influence, is of great importance. If the soil is dry, and rich, and deep, and well pulverized, the labors of the husbandman will yet not avail much, in root crops, if he suffers his plants to be injudiciously crowded, or to be choked and robbed of their food by rank growing weeds. And as prevention is better than cure, the thinning and cleaning processes should be commenced early, and rigidly persevered in, not only that the weeds may not exhaust the fertility of the soil, but that the latter growth may not mature their seeds, and thus perpetuate the evil.

In our next number, we shall treat of the culture, &c. of the root crops named in the commencement of this article.

Beet Sugar.

We notice by a letter from the Hon. H. Ellsworth to the editor of the New-York Observer, that important improvements have been recently made in France, and the neighboring countries, in the process of making sugar from the beet root. "The difficult and tedious process of ordinary evaporation, with all the concomitants of blood, animal carbon, &c. &c. are to be dispensed with, and instead of three, four and five per cent, *nine* per cent is surely to be obtained, in less time, and with half the expense: in addition to this, the common sugar is *refined* without any new solution, or even changing the moulds." "Experiments made before the French academy, show that there are in 100 lbs. of beet, 85 lbs. of water, 10 5-10ths pounds of sugar, 5-10ths of mucilage, and 4lbs. of fibrous matter. This was extracted by M. Becaud in eight minutes, by the aid of heat and pressure."—The beets are now sliced, dried, reduced to powder, and packed, and in this case will keep a long time. When used, a little water is put to the powder, which abstracts the saccharine matter, the liquid is evaporated, and crystilization formed. The sugar is now said to be made at an expense of five cents the pound, including the cost of the beets, and excellent refined sugar costs about seven cents. With such results, the production of this article among us, on a large scale, is rendered almost certain.

The Farmers' Garden.

ORNAMENTAL DEPARTMENT.

Start not at the caption, brother farmers. You all have your hobbies, which administer to your pleasure, without adding substantially to your purse, or your enjoyments. Flowers are the hobbies of the ladies, and of men, too, of refined taste. Flowers are the handy-work of the Creator, intended to gratify, not the animal appetite, which we possess in common with the brute, but the more refined sensations which belong exclusively to man. Their inimitable and diversified pencilings—their unsurpassed fragrance and beauty—are calculated to excite our admiration and to awaken our best feelings. "Behold the lilies of the valley; they toil not, neither do they spin; and yet Solomon in all his glory was not arrayed like one of them." We seldom if ever saw in the master or mistress of a choice flower garden, a person of bad passions or of bad habits. Accustom youth, therefore, to cultivate and to admire the flower garden, as a rational means of making them agreeable to others and happy in themselves.

The ornamental department of a garden consists of dwarf trees, shrubs, including woody creepers, perennials, biennials and annuals. These may be cultivated exclusively in a flower garden, they may be interspersed in a fruit or kitchen garden, and the trees, shrubs and perennials are peculiarly appropriate for court-yards and grounds about the dwelling. Our notice of them will necessarily be brief. We shall class them under the appellations of trees, shrubs, perennials, biennials and annuals

DWARF TREES,

Suitable for a court-yard, or for planting about dwellings, are the mountain ash, European and American, the magnolias, the glauca and acuminata being hardy, and the macrophylla and tripetela being considerably so—the Siberian crab, of which there are several varieties—the double flowering cherry and peach, the double white and scarlet flowering hawthorn, &c. Evergreens may be intermixed, about the dwelling, more or less, according to the extent of the grounds, as may also fruit and forest trees. Of the former, the white pine, fir, arbor vitæ, spruce, Swedish juniper and red cedar, are all ornamental, and add to the diversity and beauty of rural scenery.

SHRUBS.

1. Althæa *Fruitex.*—This is a handsome shrub, which flowers in August and September, rather tender for this latitude, but sufficiently hardy as far north as 42°. There are several sorts, having different coloured flowers, double and single; the single flowering are the hardiest. It may be propagated by seeds or suckers. Gather the seeds in autumn, and sow the spring following.

2. Almond, double flowering—*Amygdalis nana*—of dwarf growth, and one of the earliest and most beautiful flowering shrubs. It produces wreaths of flowers resembling small roses. Propagates rapidly from suckers.

3. Azalea, *wild honeysuckle.*—There are several indigenous kinds in our woods, all ornamental, and the white peculiarly fragrant.

4. Box, *buxus*—though not a flowering plant, is highly ornamental for edgings. It is a dwarf evergreen, propagated by cuttings and by dividing the roots. Requires some protection in northern winters.

5. Brier, sweet, *rosa rubiginosa.*—Though abounding in our fields, this is a pretty plant in the shrubbery, both on account of its fragrance and of its foliage and flowers. It is too common, like many other native plants, to be duly appreciated.

6. Bignonia *radicans*—Trumpet flower—a splendid climbing shrub. One variety, the *flammea*, has yellow flowers; another, *coccinea*, bright scarlet flowers. Propagated by suckers. Rather tender here, but requires no protection fifty miles south.

7. Cassia *Marylandica.*—Has pretty foliage, and produces many small yellow flowers. Propagated by seeds. Though the top is sometimes injured by the winter, it springs again from the root, and flowers the same season.

8. Clethera *alnifolia.*—A very common shrub, which produces fragrant flowers in clusters in autumn.

9. Cranberry, high—*Viburnum oxycoccus*—a shrub abounding in swamps and wet grounds. It wants nothing but a foreign origin to make it a desirable plant for the shrubbery.

10. Corchorus *Japonica*—Japan globe flower—will stand the winter in a protected situation, though it will not flower so well as when placed in a greenhouse. Flowers of a golden yellow, double, and much admired. Stem and foliage handsome. Propagated by suckers.

11. Fringe Tree—*Chionanthus Virginica.*—A beautiful American shrub, covered with white flowers in June. Hardy. Propagated by layers.

12. Fringe Tree, Venetian Sumac—*Rhus cotinus*—a singular shrub, loaded during summer with tufts of russet coloured down. Propagated by layers and suckers.

13. Glycine, *frutescens*—a perennial climber, with variegated flowers, much admired. A Chinese species *G.* (*sinensis,*) is less hardy, though not less beautiful.

14. Honeysuckle, *Caprifolium.*—This is a family of beautiful climbing shrubs. The scarlet and yellow monthly, the oak-leaved and the woodbine are hardy. Other species are less so. They are beautiful for arbors and walls.

15. Kalmia *latifolia*, commonly called Laurel, a beautiful evergreen flowering shrub of our mountains and forests, south of Catskill and Northampton. Like all other evergreens, it should be transplanted in the season of its growth—May, June and September being the best months to remove them, taking care to counteract evaporation, by spreading coarse litter over the roots when transplanted.

16. Lilac, *Syringa.*—Handsome flowering shrubs, of which we have the white, purple, Siberian, Persian and Chinese, the latter too tender for northern winters. They all readily propagate by suckers.

17. Lonicera.—A family of upright shrubby plants related to the honeysuckle, and perfectly hardy. The Tartarian and Siberian (or rather Iberian,) are beautiful flowering shrubs, easily increased by layers or cuttings.

18. Mezereum, *Daphne mezereum.*—A dwarf shrub and hardy, which is covered with pink flowers in March or April, before the leaves expand. Two feet high. Propagated by seeds.

19. Pæonia, *moulan*, or Chinese tree pæony. A diminutive shrub, but affording the most brilliant flowers. There are three varieties, the common, poppy-flowered and the rose coloured. They are of recent introduction, and have been generally cultivated in the green-house, but are found to be perfectly hardy in the open ground. Propagated by offsets.

20. Pyrus *Japonica*—Japan quince.—A thorny hardy shrub, covered with brilliant scarlet flowers in the spring, and also often flowering in autumn.—There is also a variety producing white flowers. This plant would make a strong and an ornamental hedge. Propagated, like horse-radish, by cuttings of the root.

21. Pyracantha, or evergreen thorn, is a pretty ornament in the shrubbery. Rather tender.

22. Rhododendron, *maximum*—rose bay.—A native evergreen of our state, of rich foliage, and clusters of beautiful flowers.

23. Rose acacia, *Robina hispida*—a hardy shrub that propagates rapidly, and produces handsome flowers

24. Rose, *Rosa.*—Of this favorite plant, botanists

enumerate some sixty species. The varieties are almost without number, and are annually multiplied by nature and art. The principal species for garden culture are, 1, the *spinosissima*, or Scotch rose, admired for its foliage as well as flowers; 2, the *Damascena*, or damask rose, embracing many termed perpetual roses, that is, blooming till checked by the frosts of autumn; 3, *centifolia*, Provens or hundred leaved, including the mossy varieties; 4. the *gallica*, or officinal, embracing the largest number of cultivated varieties; 5, *alba*, or white; 6, *rubiginosa*, or sweet brier; 7, *Indica*, or Chinese, including Bengal; and 8, *semperflorens*, or ever-blooming. The *moschata*, *Lawrenceana* and *Banksiæ*, are also cultivated, particularly in the green-house. The flowers of the rose are of all colours, from a pure white to a bright yellow and very dark red—some are dwarfs, some tall growers, and some climbers. A dozen plants, embracing different colours and varieties, are a great ornament in a court-yard or garden. Most of the varieties of the rose propagate by suckers, others require to be layered, and some are propagated by cuttings. Suckers may be planted in the autumn or spring, and should be cut down to five or six inches; and the ground should be kept clean and in good order. All the weak, dead or dying wood of roses should be carfully taken out, and it is the practice with many to cut them down in spring, to a certain height, say one or two feet, except climbing varieties, to produce strong flowers.

25. Snowberry, *Symphorea racemosa*—is a small shrub, which produces clusters of white fruit in autumn, and is ornamental. Propagates freely by suckers. *S. Punica*, or crimson berried, which carries its berries in winter, is also ornamental.

26. Spice-bush, *Lacurus benzoin*—a native of our woods, is a desirable inmate of the shrubbery.

27. Spiræa.—Several species, with delicate flowers, which are indigenous, are worthy of culture.

28. Strawberry Tree, *Euonymus*—white and red fruited, are highly ornamental, and are readily propagated from the seed.

29. Syringa, *Philadelphus*.—There are three species, all worth cultivating, admired for their flowers, and the *coronarius* (mock-orange,) for its fragrance. Propagated by suckers.

30. Sweet-scented shrub, *Calycanthus floridus*—has flowers of a brown purple colour, of an agreeable odour, like spices—leaves fragrant.

Perennials, biennials and annuals in our next.

Blight in Grain caused by Barberry Bushes.

We find a strong confirmation of the correctness of Sir Joseph Banks, in saying that barberry bushes caused rust or mildew in corn crops, in a communication of the Rev. Dr. Singer to the Highland Society of Scotland. The Doctor states, that the loss annually sustained in Dumfriesshire, by this distemper on the crops, amounted to more than £1000, or 4,444 dollars; that Sir W. J. Hope, to test the correctness of Sir Joseph's theory, caused the total extirpation of the barberry bushes upon his estate; and that *since that was done, and for above twenty years, no such distemper has appeared in his fields.* And he adds, the same thing has been done in some parts of Ayreshire, and the same result has followed.

It is not intended to be understood, that the barberry bush is *the* cause, but merely *a* cause, of the mildew. The mildew, or rust, is known to be a parasite; but it is contended, that this parasite belongs to a genus of plants; that different species infest, exclusively, different plants, and that that upon the barberry bush is not the species found upon wheat, oats, &c. The mildew prevails where there are no barberry bushes; but if we admit the malign influence of this bush upon grain, we may with equal propriety admit, that other trees and shrubs which, like the barberry, are the home of rust, as the poplar, willow, and a great many others, have an equally malign influence upon the grain. Two contingencies must occur, it would seem, to favor the propagation of mildew—plants affording its seeds, and a suitable state of the atmosphere to waft these seeds to the standing grain.

Recipes for the Family.

Cement to mend broken china or glass.—Garlick stamped in a stone mortar; the juice whereof, when applied to the pieces to be joined together, is the finest and strongest cement for that purpose, and will leave little or no mark if done with care.—*Dom. Ency.*

Cement for stopping cracks in cast iron boilers.—Common salt by measure four parts, smithy slack one part, flower of sulphur three parts, flour one part, water to make the ingredients into a paste.—*Ib.*

Another which we have proved.—Beat up the whites of eggs, and add powdered unslaked lime to make a paste, and fill with it the cracks in iron vessels.—Though it does not reunite the iron, it will prevent the vessel leaking.

A cement that resists the action of fire and water.—Take half a pint of milk, and mix it with an equal quantity of vinegar, so as to coagulate the milk. Separate the curd from the whey, and mix the latter with the whites of four or five eggs, after beating them well up. The mixture of these two substances being complete, add quick-lime to them which has passed through a sieve, and make the whole into a thick paste of the consistency of putty. If this mixture is carefully applied to broken bodies or to fissures of any kind, and dried properly, it resists fire and water.—*Ib.* [We have tried it successfully to stop leaks around chimneys in the roof.]

Cement for a floor.—A very hard and dry, and also incombustible cement for floors, in lieu of boards or bricks, is, tar thickened with pitch, and while hot made into a plaster with common wood ashes, as much as the hot liquid will take up.—*T. Cooper.*

For Shoe Blacking.—Mix lampblack with a little sugar and the white of an egg: Then dilute with stale beer.—*T. Cooper.*

In grafting, Wilson, in the economy of the kitchen garden, recommends fresh cow-dung, instead of clay or composition, for covering the wound—merely tieing over it a piece of bladder or oil cloth to prevent its being washed off by the rains. From the known healing qualities of cow-dung, we have little doubt but it would prove an excellent substitute.

To make salt butter fresh.—Put four pounds of salt butter into a churn with four quarts of new milk, and a small portion of anatto; churn them together, and in about an hour take out the butter, and treat it exactly as fresh butter, by washing it in water, and adding the customary quantity of salt. This is a singular experiment. The butter gains about three ounces in each pound, and is, in every particular, equal to fresh butter.—*Dom. Ency.*

To purify Tallow.—When the tallow you are about to employ to make candles, is very dirty or rancid, an ounce of pearlash to about ten pounds of tallow, put into the water where the tallow is melted, is of service.—*Cooper.*

A cheap mode of preserving Plums and Grapes, has been communicated to us by a female correspondent. The process consists in alternating them in an earthen pot, the bottom of which should be previously covered with melted butter, with sugar—every three thicknesses of fruit to receive a slight sprinkling of sugar. The pot when filled, is to be covered, and set into an oven gently heated, so that the fruit will crack open, and kept there until the juice becomes thick or candied. The fruits may then be taken out, packed close in stone jars, covered with a little sugar, and kept for use, and will retain their natural flavor. When used they may be sweetened to suit the taste, and if wanted for pies or puddings, a little warm water put upon them will cause them to swell and become tender. The benefit consists more, we suspect, in retaining the natural flavor of fruit, than in the economy of sugar.

A Yankee desideratum—Pumpkin Pie, good Pumpkin Pie, without molasses or eggs! Accompanying the above, we have an assurance, that a new Shaker pumpkin, a cross of two choice varieties, is so rich and fine grained, that it requires neither sugar nor eggs to convert it into first rate pumpkin pie. Nor is this all, the pumpkin does not require to be divested of its rind, but merely scraped, ere it is boiled.

Remedy against Moth.—Our furs, and our woollen apparel, &c. are liable to be seriously injured by moth, in the summer season, when they are not in use.—We give the following simple preventive, which, although known and practised by many, may be new and servicable to some. Put your furs and wollen apparel into linen or hempen bags, and sprinkle the bags with spirits of turpentine—moth will not touch them.

A Butt Hinge Manufactory,

Is now in operation at West-Troy, the first we believe in the United States, and on an improved principle. With half a dozen boys and a couple of men, it will turn off a hundred dozen pair of door butts in a day, of a quality superior to those ordinarily imported, and at as low a price.

The best Manure for Clay Soils,

Is sand and ashes, or sand and lime: also plough deep, and expose it in the autumn in ridges, throughout the frost of winter, as the brick-makers are accustomed to do.—*T. Cooper.*

Stone Walls in Ireland,

Are built, says the Roscommon Report, without mortar, by dry wall masons, with nearly the closeness and accuracy of house walls. They build by a frame, nearly two and a half feet at the bottom, and eighteen inches at top. These are the dimensions suitable to a permanent wall six feet in height, which is usually coped by two substantial sods of three inches in thickness. The first is laid with its grassy side down, on about an inch of level mould, on the top of the wall; and the second inverted upon that, with the grass uppermost. This species of fence, with very little attention paid to it, will be safe at the end of fifty years. The expense of such a wall in Ireland, including quarrying and drawing the stone, is but 5s. 7d.—about $1.20—per running perch. In proportion to the diminution of height—and five feet would be deemed high enough with us—will be that of width and expense of building.

A table of various Foreign Coins, &c. with their value in Federal Money, as established by an act of Congress.

	$	d.	c.	m.
Pound sterling,	4	4	4	0
Pound of Ireland,	4	1	0	0
Pound of the Canadas,	4	0	0	0
Pagoda of India,	1	9	4	0
Mill-rea of Portugal,	1	2	4	0
Ruble of Russia,	0	6	6	0
Rupee of Bengal,	0	5	5	0
Guilder of the Netherlands,	0	3	9	0
Mark Banco of Hamburgh,	0	3	3	5
Livre of France,	0	1	8	5
Real of Spain,	0	1	0	0

A table of the weight and value of certain Foreign Coins.

Names.	Standard weight.		Federal value.				
(*Gold.*)	*dwt.*	*gr.*	*E.*	*D.*	*d.*	*c.*	*m.*
A Johannes,	18	0	1	6	0	0	0
A Half Johannes,	9	0	0	8	0	0	0
A Doubloon,	16	21	1	4	9	3	3
An English Guinea,	5	6	0	4	6	6	7
(*Silver.*)							
English or French Crown,	19	0	0	1	1	0	0
The dollar of Spain, Sweden or Denmark,	17	6	0	1	0	0	0
An English shilling,	3	11	0	0	2	2	2

Economy of Health.

We had forgotten our promise to give occasional extracts from this admirable work of Dr. Johnson, till reminded of it by a friend. We now proceed to make some extracts from the seventh septenniad—from forty-two to forty-nine years.

"Seven times seven! Awful multiple!—This is the crisis of human existence; for, however we may conceal it from others, or even from ourselves, the decline of life commences with the seventh septenniad. At that period the tide of existence has swelled to its utmost volume, and its last and highest wave has left its mark on the craggy rock and golden sands. It is true that, while contemplating the ocean, for some time after the ebb-tide has commenced, we do not remark the subsidence of the waters—unless we watch the shores from which they recede. Then we will perceive indubitable proof of the turn of the tide. So it is with human life. For some time after the meridian of manhood, we recognize not the decadence of the stream—until we reluctantly and sorrowfully remark certain changes for the worse in our corporeal—perhaps also in our mental powers! There are, even in this early period of declension from the meridian, certain admonitory phenomena that cannot be wholly overlooked by the most thoughtless individual. A grey hair will obtrude its unwelcome presence, and, if plucked out, will return soon, with half a dozen companions! Pleasures of all kinds, but especially of a material nature, begin to lose something of their exquisite relish, and are succeeded by something more than mere satiety. Bodily exertions begin to be, not only curtailed in their range or amount, but the period of recruit becomes proportionally extended. Impressions on mind and body are less vivid. Our wine excites us less; and even the delights of convevialiaty and intellectual intercourse experience a diminution of intensity!

"It is in the seventh septenniad, too, that the three master passions of the soul, love, ambition and avarice, come nearer to an equipoise than at any other epoch. These passions are never, indeed, exactly equipotent. One is always more powerful than either of the other two—sometimes stronger than both together. Thus, in youth, love predominates—in manhood, ambition—in age, avarice. Still it is in the seventh septenniad that the antagonism of the three passions come nearest to an equilibrium. Ambition has, generally, the mastery. Love has lost much of his influence—and avarice, under various masks, as domestic economy, desire for providing for a young family, &c. &c. begins to pull against the other passions, with augmenting force and confidence. Having once gained strength, this passion never quits the field till it overcomes, and finally extinguishes one or both of its antagonists.

"It is towards the close of this septenniad, also, that the grand climacteric of woman takes place. Forty-nine is an important epoch in female life—an eventful crisis, which often turns the balance between weal and wo—between steady health and dangerous disease!—If woman passes this period unscathed, she stands a good chance of a serene and quiet descent along the slope of existence in the vale of years, where the last debt to nature is to be paid! But it behoves her to be on her guard during the whole of the seventh septenniad, and not to allow fashionable dissipation, late hours, and gossamer dress, to render her grand climacteric the crisis of her fate."

Our author next proceeds to speak of what he denominates the "Patho-protean malady," as occurring in this septenniad, and as a *master-malady* of recent origin. "No name, no description of it," he remarks, "is found in the records of antiquity, or even of the middle ages. It is clearly the offspring of civilization and refinement—of sedentary habits and intellectual culture—of physical deterioration and mental pertrubation—of excitement and exhaustion." * * * "Though millions have felt it, no one can describe it—though thousands have studied it, no one has been able to frame for it an accurate definition. And no wonder. It is a PROTEUS which assumes the form, and usurps the attributes of a-most every malady, mental and corporeal, that has scourged the human race since the creation of the world." * * *

"There are numerous causes of this modern scourge, which cannot well be classed under the heads of either the MORALE or the PHYSIQUE. They partake of both. Such, for instance, are the habits and pursuits of a people. In this country commerce and manufactures preponderate over agriculture and pasturage—and therefore sedentary predominate over active habits. The factory and the counting house are not only more unhealthy, in a *physical* point of view, than the hills and the vales, but they are much more detrimental to the *moral* constitution of man. The labor is thrown on the head and the hand—and that in bad air—rather than on the body and legs, under the canopy of heaven. This difference contributes largely to the support of the PROTEAN malady, especially when aided by the competition of trade, the animosity of politics, and the rancor of religious bigotry. These and various other moral and physical agents have, unfortunately, increased since the termination of a long and sanguinary conflict with the common enemy, during which internal dissentions were swallowed up in national enthusiasm, and redundancy of population was kept in check by the waste of war! Peace, therefore, with all its blessings and comforts, is not without its alloy. Our gigantic struggles with foreign foes are now transmitted into fierce contentions between opposing factions. Every evil passion is enlisted in this domestic strife.—The forum, the bench, the hustings—nay even the pulpit—pour forth, like volcanoes, the destructive elements of discord, hatred and animosity, among all ranks and classes of society."

"The pith of nearly all that has been written on HYGIENE, or the prevention of diseases—and of the protean disorder among the rest, might be included under two heads—almost in two words—TEMPERANCE and EXERCISE. But temperance means much more than mere moderation in eating and drinking. It comprehends moderation in all our pleasures and enjoyments, mental and corporeal—it prescribes restraint on our passions—limitation of our desires—but, above all, limitation of our ambition.

"Our physical wants, like the trade winds, vary not materially, in direction or force; not so the passions.—They are the tempests of life, which too often set at defiance the sails and the rudder, driving the vessel upon shoals and quicksands, and ultimately wrecking her altogether!"

* * * "But it would be wrong to pass over the various miseries rusulting from the "PLEASURES OF THE TABLE." The intellectual and sensual banquet has too many charms for soul and body, not to lead into almost daily excess, every class of society, from the savage to the sage! Even here the immaterial tenant seduces its material tenement into woful sufferings. We hear a great deal, indeed, of "the feast of reason and the flow of soul:" but, for my own part, I have too often observed this intellectual festival to take place where

'Malignant CHEMIA scowls,
And mingles passion with the nectar'd bowls.'

It is more curious than consolatory to scrutinize, with philosophic eye, the workings of turtle, champaign and conviviality on those fierce faculties with which metaphysicians have invested the immortal principles of MAN. Without diving into these mysterious and dangerous investigations, I shall only remark, that *every* faculty of the mind, as well as every function of the body, comes under the influence of the above mentioned material agents, and in a manner that is well worthy of investigation, in regard to the immediate subjects of this essay—HEALTH and HAPPINESS.

"In the '*Feast of Reason*,' as it is called, which is generally accompanied by food of a grosser kind, we find the energies of the mind called forth—one would almost say *created*—where they were previously dormant. Sallies of wit and humor—sentiments of noble philanthropy, exalted morality, and even fervent religion, spring forth at the festive board, which lay in abeyance till that hour! It is then that friendship opens our heart,—the miser his purse,—bigotry widens the circle of its charity—the debtor forgets his creditor—the creditor forgives his debtor—the slave breathes the air of freedom—penury becomes possessed of temporary or, at least, ideal wealth—and stranger still, riches are invested with momentary happiness!

"Are these remarkable phenomena of the *mind*, unconnected with, or independent of, any corresponding phenomena in our physical organization? Far from it! Savory viands and generous wines stimulate the material organs, accellerate the circulation, and call forth the mere *animal* spirits, before they elicit the *intellectual* corruscations. And as excitement of the body produces excitement of the mind, so passions of the mind kindle up excitation in the corporeal fabric. On the stage and at the bar, passion is more frequently feigned than felt; but in the pulpit and the senate, religious fervor and political disputation will call forth the most violent agitation of the body through the medium of the mind. Painting, poetry, music and oratory, cannot raise emotions in the mind, till they have first excited certain nerves of *sense*, and, through them, the very brain itself—the organ or instrument of the mind. This is the grand consideration, as far as health and happiness are concerned. It establishes this important axiom,—little understood or attended to by mankind at large—namely, that whenever the stream of life, whether moral or physical, mental or corporeal, is accellerated in its course beyond the nominal or medium current, it must experience a corresponding retardation in turn—and these inequalities in the speed of the stream must inevitably damage, sooner or later, the banks between which it is enclosed. There is not an axiom in physics or physiology more certain than this—that the even tenor of the stream prolongs life, preserves health, and maintains happiness; while, on the other hand the strong excitements, whether of body or mind, afford temporary enjoyment, at *the* expense of permanent sufferings. It is true that the elasticity of youth and health, renders the penalties of indulgence short at the beginning, and amply repaid by the pleasures of the feast, whether intellectual or corporeal. But the periods of enjoyment gradually shorten, while those of pain are protracted, till at length a balance is struck that awakens the delinquent to a frightful survey of the real condition in which he is placed! It is then, in general, too late to retrace our steps.

"Now the besetting sin of the present generation is not that of intemperance in eating and drinking—but rather in that of reading and thinking. And why is this? When the intellectual powers are much exerted, the physical powers, and more especially the powers of the digestive organs, are weakened. Hence we have neither the relish for gluttony nor inebriation, nor have we the ability to bear their effects. Add to this, that the exercise of the rational faculties dissuades from intemperance, independent of withdrawing the power of indulging in it. In rude states of society, where the higher functions of the mind are but little employed, the sensual gratifications of the palate and stomach constitute the principal pleasures of life—and the organs being strong, these pleasures are exquisitely enjoyed, and borne with comparative facility. The coal-heaver, on the banks of the Thames, whose brain is nearly as inert at the sable load under which his muscles crack, will drink ten or twelve quarts of porter, besides gin, in one day, and go home as sober as a judge at night. But let the JUDGE himself, whose active brain absorbs all energy from his muscles, try this experiment!

"Here, then, is the true solution of the problem—the real causes why the present generation are more temperate than their ancestors—namely, disrelish for, and inability to bear intemperance, as compared with those of the olden time. But the effects of intemperance have not diminished in proportion. On the contrary, they have multiplied prodigiously. What was ultra-abstemiousness a hundred years ago, would now be destructive excess. The habits and manners of the hardy Highlanders, in the days of Waverly and the wassail bowl, would ill suit the natives of Glenco and Tobermory in the present day. Tea, politics and steam, have wonderfully impaired the digestive organs of the Celt and Sassenach laird since the days of Bradwardine and Tully-veolan, though, some of their descendants appear to have, even yet, their stomachs lined with copper, and proof against the fiery impressions of the most potent Glenlivit!

"Thus, then, a nervous temperament—a morbid sensibility—pervades the whole frame of society, more or less—a supersensitiveness that inflicts pains and penalties on trifling and occasional indiscretions, which used formerly to be levied only upon habitual and excessive indulgence! There are many millions in this country to whom food is physic of the bitterest kind—and to whom physic is daily as indispensable as food! To the luxurious epicure it may seem incredible that, within the boundaries of the British isles, there are millions, among the opulent classes, who would give half their wealth to be able to do without food altogether—who would gladly give up the pleasure of *eating*, for an immunity from the misery of *digesting*. Incredible as this may seem, it is nevertheless strictly true.

"I wish I could state, consistently with truth, that the punishment falls exclusively on the intemperate—that the gourmand is the only victim, in the end, of indigestion, and all its indescribable horrors. But I am compelled to aver that this penalty falls far more frequently on the innocent than on the guilty—on those who labor with their heads for the good of society, rather than on those who consume the fruits of the earth in luxury and idleness—on the unfortunate far more often than on the offender."

We invite the tillers of the soil, who have the healthiest employment given to man—who may, without prejudice, blend the pleasures of intellect with the healthful robust labors of the farm—to peruse the preceding article with attention—and to remember that it comes from one of the most eminent physicians of the day. How many young men, whose health is considered too delicate for farm labor—are sent to studious and sedentary employments—the very situations, above all others, calculated to aggravate the malady, and to shorten life! How many are there, who, under a mistaken notion of adding to their happiness in life, are sent from the farm to the counter, the bar, the pulpit, &c. with the almost moral certainty of rendering them the premature victims of disease and wretchedness! Study, it is here seen, is deleterious, when its effects are not counteracted by due *exercise in the open air*, and by *temperance* in the indulgence of the appetites and passions. The farm—the farm—is the place, above all others, where the blessings of health, and the pleasures of intellectual enjoyments, are to be found most happily combined.

EXCULPATORY.—From the information we have received, we feel bound to exculpate the Rev. Mr. Abeel from any sinister motives in the part he has taken in getting up common school libraries. On the contrary, we are assured, that he has devoted much time and money to promote the undertaking, without the expectation of ultimate reward.

CORRESPONDENCE.

Cutting Corn Stalk Fodder—the Grub Worm—Doctoring Fruit Trees—Root Culture.

Williamstown, Mass. Dec. 20th, 1838.

Hon. J. BUEL—Dear Sir—I have not the happiness either to bear the honorable title, or to share the enviable labors, of the *professional farmer*: yet, having been accustomed in early life to the occupations of the field, for which I still retain a relish, and having made it for several years my relaxation to supervise the general conduct of a little farm, whose details are carried out by proxy, my sympathies are in a measure with the cultivators of the soil, and I feel a sufficient degree of interest in whatever pertains to the *improvement* of any branch of the great agricultural economy. That material advances have been made within the last few years in this most ancient and important of all the arts, I think, admits not of a doubt; and that the most considerable agent in effecting such a change, has been the prevalence of *mutual information* during this period, I hold to be alike unquestionable.

Entertaining opinions like these, it will not be thought strange if I feel an inclination to contribute *my "mite,"* (if indeed I turn not out to be more *miteless* than the "widow,") towards the still further promotion of what has been by some denominated "book-farming." It is in compliance with such an inclination that I submit to your inspection the following items, the "raw material" of which I find in my "Farmers' Journal." If you deem them of consequence enough to merit a place in your columns, please to present them to your readers; if otherwise, give them a place among such other "crums" (unfit for "the dogs,") as you cast under your table, and pardon me for inflicting upon you the misery of giving them a bootless perusal.

Item First—Cutting Corn Fodder for Cattle.

Having occasion, about the middle of November, 1836, to pass through your city, and stopping for an hour at Bement's Hotel, I had an accidental opportunity of witnessing the operation of a "Green's Straw Cutter," and so well was I pleased at first sight with its execution, that I proceeded immediately to Thorburn's and made a purchase. Feeling a *little bit streaked*, as "Slickville" would say, after getting it home, lest some of the more "knowing ones" among my neighbors, should take it into their "bump of self-esteem" to underrate my wisdom in parting with "thirty round dollars for a little machine," which Sampson would have pocketed just in the way we common folks do a jack-knife, I made some haste to get it into effective operation, working up hay and straw for my horses, and stalks for my cattle. Of this latter article, I had on hand the produce of some 4½ acres, heavy growth, and I directed my man to prepare of it daily a quantity sufficient for the *keep* (your pardon, Dr. Webster,) of five cows; which quantity proved not to vary much from ten bushels, and occupied in the preparation from one to one and a half hours per day. On this allowance, with pretty uniformly a little oat straw in the yard at noon, my cows were kept until some time in April, when the supply was exhausted. I never wish to have my cows winter better. Of the fodder thus prepared, (cut simply, and neither brined, salted nor steamed,) and fed to them in mangers in their stalls, they consumed, by measure, five parts out of six; the rejected portion consisting entirely of the largest *buts*. These were thrown daily into the yard, as refuse; a measure to be placed entirely to the score of mismanagement, for had they been left in the mangers, and the allowance shortened a little, I am since convinced, they would have totally disappeared.

At one and a half hours per day, for four months, the *time* consumed in preparing the fodder amounts to seven and a half days; which, at four shillings per day, will make the *expense of cutting* $5. The *saving in the fodder* cannot be fairly estimated at less than one-third of the whole, or the entire keeping of 1½ cows (so "Colburn" cuts up cattle,) for four months. This being equal to the keeping of one cow for 6 months may be quickly set down at the current value of two tons of good hay, say $20. Clear profit, $15. But this is not *all*. The *improvement of the manure*, consequent on this mode of feeding the stalks, instead of casting them *whole* into the yard after the common practice, is of itself almost an equivalent for all the extra expense.

The 1st of December, 1837, I commenced in the same way, on the produce of four acres, (very heavy growth of the large Dutton,) except that I fed it to 20 two year olds. These had previously eaten no hay, and I instructed my man to keep them rather close for the first few days, in order to induce them to clear their mangers. In this I succeeded so completely, that at the end of feeding the stalks, I could say without hesitation, I did not believe, that of the whole supply, *a pound to the ton* had been wasted by *rejection*. From beginning to end, a single shovel full of leavings had not been removed from the mangers, and *at* the end, a shovel full could not have been obtained from them. These cattle were also allowed a little straw once a day in the yard. A short time previous to their commencing on the stalks, they were purchased in the neighborhood, at $17½ per head. When they had finished them, some two months after, I could have readily sold the whole of them at $25 per head. Advance on their aggregate value, $150. I have not yet been *laughed at* for purchasing the Straw Cutter; and should I, by any accident, be deprived of the one I now have, I would run the *risk* of being laughed at, and pay $100 for another, could I not obtain it cheaper. I understand, however, that the price of the article is getting *reduced*, in which I very much rejoice, as I should like to see it introduced *generally*.

I should have remarked before, that my stalks are uniformly cut *at the ground*, which practice of course I fully approve. The largest buts are cut without difficulty, and in no way injure the knives of the cutter.—These I have hitherto been under the necessity of sharpening no oftener than once in twelve months, though the amount of work done by them, in hay, straw and stalks, has amounted to not less than from ten to fifteen or twenty tons per year. To facilitate the operations of the machine, I annex to it a *false* apron for the purpose of receiving the stalks, the *true* one being of insufficient dimensions, and occasionally *clear the spaces between the knives*, with an instrument kept at hand for this purpose.

Perhaps, from what has been advanced above, I may be thought by some to have a *strong motive* for recommending "Green's Straw Cutter." I certainly have, sir; and an equally strong one for speaking in favor of any *other* cutter that will do the same execution, and consequently afford the same profit to the owner. The only inducement I have to say a word in favor of *any* machine of the kind, is to be found alone in the results of the above detailed experiments.

Item Second—A great Enemy to Corn,

as many a desolated field of the last season can bear me witness, is the cut worm, or black grub. To prevent the depredations of this unwelcome visiter last spring, I caused each hill of my corn. immediately after planting, to receive a common handful of good *live ashes*, and another immediately after weeding. This proved, however, to present no obstacle to the progress of the enemy, and I soon discovered that my whole field was more than decimated, and the work of destruction advancing briskly. I therefore ordered my men, as a last resort, to "prepare for *war*"—to "sharpen their finger ends," and set at once about exhuming the marauders. For several days it seemed as if "a whole procession came to each one's funeral," but at length victory wreathed the brow of perseverance; and the precaution having been taken to replace each foe dislodged with a suitable quantity of good seed corn, I soon had the pleasure to see my field restored, in a good measure, to its original order and beauty, there being seldom a vacancy in a piece of four acres. The latest planted came to maturity, (the white flint being the variety used for replanting,) and the produce of the field was estimated at 45 bushels to the acre. Had I not pursued the course above indicated, I am confident that the average of the crop would not have exceeded 30 bushels to the acre.—By the process of "grubbing," then, I secured an increase, in the produce of the four acres, of 60 bushels of good sound corn. The time consumed in the operation was probably equal to about eight days. Eight times five Yankee shillings is $6.67. Sixty bushels of corn, at ninety cents per bushels, is $54. Difference, $47.33. From this deduct the further expenses of harvesting, &c. &c. (not forgetting, however, that the *stalks* are worth something,) and there will still be left a remainder well worth pocketing by any small farmer. I would therefore recommend it to "the profession," whenever annoyed by the above-mentioned enemy, to "go and do likewise."

Item Third—"Doctoring" Fruit Trees.

Very often does it happen that a valuable young fruit tree is sacrificed for want of a little "doctoring." Some time in the latter part of June last, a street-running cow, through the inadvertence of a lad on the premises, gained admission, just at evening, into my fruit-yard.—Attracted by the appearance of a fine Bolmer plum-tree, five years from the nursery, full of luxuriant foliage and young wood, and richly laden with its first offering of fruit, she made a rude attack upon it, broke it down to the ground, and before the mischief "got wind," succeeded in stripping it entirely of its young wood, one of its largest branches, and nearly all of its fruit. My vexation on discovering the accident was extreme. It was a favorite tree, and I had watched over its growth for years, with an unusual interest: it had now come forward into full bearing, and already had my "mouth watered" in anticipation of its exquisite fruit. But there lay my "castle," in pitiful ruins. I had no hope whatever of repairing the misfortune. So with a length of visage that bore no mean comparison with that of the luckless cow, I turned me away to comfort myself as well as I could with that wonderful nostrum "What cannot be cured, must still be endured." By the next morning, however, I had made up my mind to *attempt a cure*. "There is nothing like trying." I accordingly commenced by examining the wound. The tree was broken quite down, about two inches from the ground, and all that held the root and stock (or "soul and body") together, was a thin slip of wood, not larger, to speak safely, than my smallest finger; and even from this, *the bark was severed* for nearly three inches. A pretty bad patient, surely; however, I proceeded, raised it up to a little more than a perpendicular position, and confined it firmly, in different directions, by several thongs, made fast to stakes which I had driven for the purpose. By placing the tree in this position, I brought the bark into the closest possible contact with the slip from which it had been dissevered; and by confining it thus in different directions, prevented the winds from racking and twisting it, and frustrating my intention of reuniting the parts. I next proceeded to lay over the entire fracture a thorough coating of grafting wax, to exclude the *air*, and finished the operation by raising a cone of fresh clay loam, to the height of eighteen inches about the stock, to avert the influence of the *sun*, not only from the wax, but also from that part of the stock contiguous to the wound. To my surprise, I discovered within a week, that it was putting forth fresh leaves and new wood. This it continued to do, and even to *ripen a number of plums*, which I had left upon its mutilated branches. At length, by the middle of October, I had the pleasure to see its new wood pushed, in numerous instances, to the length of six or eight inches, and to *taste of its fruit completely matured*. Having taken the further precaution to give it another good dressing of loam, I am now fully confident that it will outlive the winter, and another spring "go on its way rejoicing."

Item Fourth—A peep at Root Culture.

On the 18th day of October last, I took from 108 feet of ground, in my garden, 7½ bushels, large measure, of mangold wurtzel, being at the rate of 3,025 bushels to the acre; and from 90 feet, four bushels of carrots, being at the rate of 1,936 bushels to the acre. This teaches me what I, J, K, or any body else, *might* do on a larger scale. Respectfully,

ASAHEL FOOTE.

English Potato Oats.

Having unexpectedly met with a small quantity of *English Potato Oats*, in Baltimore, (of which the Irish make their oat-meal bread,) and for which, I paid $3 per bushel, I tried them on my land in Westmoreland, and realized a most surprising increase. The oats I obtained from my land, are far superior to any other in *quality, quantity and straw*. A friend of mine procured *one gallon* of the oats, sowed them in drills, on a *very rich soil*, and obtained about *eight bushels from the gallon*, with an abundance of excellent straw.

G. GLASCOCK.

Westmoreland C. H. Va. Dec. 1838.

Cultivation and Profits of Potatoes.

Warren, Herkimer co. Dec. 26, 1838.

J. BUEL, Esq.—Sir—Being a constant reader of your very valuable paper, I have noticed with thrilling interest the various improvements and experiments which have been made in the different departments of agriculture, and I rejoice to see such a growing interest in many, to become more intimately acquainted with the best methods of cultivating the soil, as also erecting the most convenient buildings for housing its products, so that the business may not only become pleasant but profitable to those already engaged in it, but shall induce others to embark in the same healthy and pleasant business. That I might cast in my mite into the scale of valuable experiments already published, I have been induced to send you my experience of about twenty years, of the best method of cultivating that most valuable root, the potato. When I say the most valuable, I mean as I say, especially in this region, I think it takes the preference of all. By this, I do not mean to despise any of the other varieties; they are all valuable in their place.

My way of raising potatoes is to have, first, a good fence; then clear the land from stone, and either fall plough, or plough early in spring, as soon as the frost is sufficiently out. Here I would remark, that very late fall ploughing is not as good, in general, after my manner of preparing land, as early spring ploughing, for this reason—whatever you turn in late in the fall, when the weather becomes cold, settles down in a hard state at bottom, and there remains dead, but not rotten, until it is turned up to the air. If I fall plough for the potato crop, or any other, where it is to be ploughed again in the spring, I choose to plough the fore part of September, when the ground is yet warm, so that the process of decomposition of all the vegetable matter, may at least be commenced before cold weather; then when you turn it up in the spring, it is in a suitable state to be food for the plants. I am much pleased with the mode of keeping debt and credit with certain crops, and I shall take the liberty of sending you a statement of the profits from a piece of ground planted with potatoes; and herein your readers will see my manner of cultivating the potato in full, which mode, as I said before, I have practised about twenty years, and shall continue to practice, until some of your numerous readers point out a better method, or I find out such, by actual experiment. If any of your readers should be willing to try the experiment, and will give the result in your valuable publication, I shall be richly paid for all my trouble:—

Potato Field,	*Dr.*
To 1½ days ploughing first time,	$3 00
To 1 day with team dragging,	2 00
To 2 men, boy and team 2 days, drawing and spreading manure,	5 00
To 70 loads long manure at 2s	17 50
To ploughing 2d time,	2 00
To 2 hands and team fitting ground and planting,	2 50
To bushing, cultivating and ploughing, 1 horse,	1 25
To 2 days hoeing,	1 25
To 7½ days harvesting,	5 62
Interest on land at $50 per acre, 1½ acres,	4 25
	$44 37
Cr.	
By 600 bushels potatoes at 25 cts.	$150 00
Deduct cost,	44 37
Profits,	$105 65

This piece of ground, my neighbors tell me, had been under the plough ever since the land was cleared, say 25 or 30 years, and was apparently completely exhausted, or worn out, as some of my neighbors told me, and as the crop told previous to its coming into my possession, five years last spring. I cleared off the stones, ploughed very deep, sowed with barley, without any manure, had a tolerable crop; seeded with clover and timothy, mowed it for hay, year after year, till last year, when I fall ploughed a part, and the rest early in spring, let it lay till some time in May, then harrowed it thoroughly, then drew on my manure, spread it and ploughed it in; then dragged the ground until well pulverized; then about the first of June, planted. My method is first to take my corn marker, with three teeth, two feet eight or ten inches apart, mark the ground one way, so that the rows may not only be straight, but all at one exact distance, then furrow with a light plough in the same marks, then take my marker and cross the furrows, so that every hill stands at an exact distance. When the ground is thus prepared, commence dropping the potatoes the same way the ground is furrowed, observing the cross marks, so that the rows are straight both ways, at the same time treading on every potato, to prevent them being removed out of the place by the horses; after two or three rows are dropped, I take my team and plough and commence covering, by turning a furrow each way on to the potatoes; in this way, two of us with one team, furrowed and cross marked, dropped and covered, the 1½ acres I have described, in one day, taking all the potatoes at the same time from the cellar.—Here I would remark, by the by, that land that lies high and dry we calculate to furrow to about half the depth of soil broken up; but on flat land that lies rather low, furrow very shallow. In this way of planting, there are several advantages over that of covering with a hoe; first, the labor is much less; secondly, you stir all the ground; thirdly, you cover them much better; fourthly, you throw all the soil and manure on the rows, and fifthly, if your ground is wet, these furrows receive all the surplus water, and leave the hills dry.—In this way we have never suffered any loss when we have planted on flat low ground, while I have known many of my neighbors suffer very much by having their potatoes immersed in water, and rot in the ground.—Another advantage over that of covering with a hoe is, in after tillage, when covered with a hoe, there is no way of cleaning the hills from weeds but with a hand hoe; but in our way, you will observe, there is a ridge thrown over the row, and just before the potato shoots through the ground, we take a good heavy bush and cross the ridges, which sweeps off every vestige of weeds, grass, small stones or lumps of earth, and drops them in the furrows between the rows, leaving the hills perfectly clean, and at the same time leaving the ground light and mellow. As soon as the potatoes are up, so that we can follow the rows, we cross the rows with a cultivator, or, if destitute of one, take a one horse plough and go as near the potato as possible, without disturbing it, so that the ground may be kept light and mellow; after six or eight days, we go through with the same process the other way; after six or eight days more, we take our two mould-board plough, or horse hoe, as some call it, and go one furrow in a row, or between the rows, leaving them thus till the potatoes are of a suitable size for earthing for the last time, and this must be done before the tops begin to fall, or set for blossoms; then we go through the other way with the plough for the last time, and the tilling is about accomplished. We generally go over them lightly with a hand hoe, but this part of the labor is soon accomplished. In our field, this year, we left three rows without using a hand hoe at all, either in planting, or hoeing for an experiment, and when harvesting, we dug two of the rows where the hand hoe was not used, and two of the others adjoining, measured them exact, and found there was no difference perceivable, except in a few hills falling a little short, in consequence, as I suppose, of laying through a small piece of quack grass. On the whole, however, we think it best to go over the ground with a hand hoe, and just haul up the earth from each side of the hill lightly, leaving it flat and broad, so that the potatoes may have all the advantage of dews and light showers. The manner in which some hill their potatoes, we think very injurious; in some seasons, the earth being thrown up in the form of a coal-pit, such as we used to make when we were boys, very sharp at top, gathering the tops or vines into a small compass, and thereby retarding their

growth, and barring them from receiving any benefit from dews or showers, unless they come in copious effusions.

And now I have given you, in as concise a manner as possible, my manner of cultivating the potato, which I think has the decided preference of any other way, that I have ever learnt, both in labor saving as well as in product and tillage. One thing, in preparing the ground, slipped my mind, that is, when I spread my manure, I sow on plaster before ploughing in, at the rate of 1½ bushels to the acre, which I think very beneficial where your manure is very long, and in that way it helps in some way or other to decompose it, so that it more readily mixes with the soil, but how I am unable to tell; but that it does, in some way, I am pretty certain. I have practised it several years. Two years since, I omitted sowing any, for an experiment, and I do not wish to try it again, as it gave me much trouble in clogging my plough, and when I have used plaster, I have had none of this trouble.

If, sir, you should think this worthy of a place in some corner of your valuable paper, and will in any way benefit the agricultural interest, I should be pleased at some future time to give some further experience on the same subject. Respectfully yours,

EBEN. W. FRENCH.

REMARK.—We are free to say, that we think the management of the potato crop, as described above by Mr. French, is the cheapest and best mode that can be adopted; and although the details may to some appear tedious, they are well worth reading and being treasured up. The effect of fall ploughing, Mr. F. remarks, is to cause the land to settle down into a hard state at bottom. We suspect Mr. F. turns a flat furrow. If he would lap his furrows on to each other, in an angle of 45°, every furrow would form a drain for the water, air would come to the sod, and the bottom would not become hard; yet it would not rot, with air and moisture, until aided by a warm temperature.—*Cond.*

Salting Calves.

J. BUEL, Esq.—Dear Sir—Early in autumn, I visited Mr. Samuel Look of West Schuyler, Herkimer county, N. Y. who showed me many things connected with his large farming establishment, which are worthy of record, and to be practised by others. Mr. Look is well known to be a skilful agriculturist and herdsman; but it is as the latter that his qualifications are pre-eminent. Among the many useful contrivances, is his method of *salting calves.*

As soon as his pumpkins become sufficiently ripe for the purpose, he takes a quantity equal to half the number of his calves, divides them through the middle with a knife, and lays them on the pasture ground where the calves run, with the core uppermost; into these, he sprinkles as much salt as the calves require at one time. This kind of trough is not recommended for its durability; it will not generally last longer than two or three days; but Mr. L. says this should be no objection to their use, as they are easily replaced, and he adds, he never knew calves to be injured by devouring troughs of this kind; on the contrary, he thinks the more of them they swallow, the better they appear. A large portion of his stock consists of the improved short horn breed. Mr. Look, at this date, has some half a dozen bulls, and a few heifers of this sort, all bred from some of the best families ever imported, which he would sell.

Yours, &c. N.

Butternuts, Dec. 31, 1838.

Brining and Liming Seed Wheat.

Trenton, Oneida co. Dec. 14, 1838.

J. BUEL, Esq.—Sir—Having observed in the Cultivator, some difference of opinion as to the effect of brining and liming seed wheat to prevent smut, hoping by stating to you the little experience, I have had on the subject, I may do no harm, but be of some benefit, is my excuse for addressing you at this time.

It has been the practice among farmers in this region for something like forty years, to wash and lime their seed wheat to prevent smut. Having noticed in a newspaper, nearly thirty years since, an account of a vessel loaded with wheat having been sunk on the coast of England, and before it could be taken out was so saturated with salt as to render it unfit for bread, some of it was used for seed, and where that was sown, it was observed there was but little or no smut, while in the same neighborhood, where other wheat was sown, the wheat was quite smutty, which circumstance led to the practice of using brine for seed wheat. Seeing that lime and salt, when separately applied, were beneficial to prevent smut, it occurred to me, if both were applied at the same time, the remedy might be effectual. I accordingly adopted the practice of washing my seed wheat in a brine as strong as can be made, stirring it until thoroughly wet, say from five to ten minutes; drain off the brine and spread the wheat on a floor; put on slaked lime that is dry, (when a sufficient quantity of wheat is washed,) four quarts to a bushel is sufficient; work it over with the hoe and shovel until each kernel is covered with a good coat of lime; then spread it over the floor to dry several days before sowing—the drying is necessary to prevent the moisture of the ground causing the lime to cleave from the kernel before the harrowing is finished. There is no danger of injuring the wheat by its lying after being limed—have had it lie two weeks or more—and have never been troubled with smut since the above mode of preparing seed was adopted, and am firmly of the opinion, when the seed wheat is well prepared as above stated, the remedy against smut will be found effectual. The circumstances stated by J. Hathaway, Esq. last spring, of his neighbor having sown some of his wheat soon after liming, and was prevented from sowing the remainder for several days on account of rainy weather—the former being some smutty, while the latter had little or none—I think goes to show the benefit of letting the wheat dry before sowing.

Others may have prepared their seed wheat in the manner above stated before me, but I had never known an instance. After having prepared seed wheat as above for several years, and being satisfied of its good effects, I sent an account of the above mode of preparing seed wheat, to the editor of a newspaper in Utica, Mr. Maynard, I believe, which he published about twenty years ago. Yours very respectfully,

JOHN STORRS.

Mode of Curing the Hoof-Ail.

Paine's Hollow, Jan. 12, 1838.

Mr. BUEL—Sir—In the current volume of your Cultivator, at page 55, you have said something on the subject of the poison of the ergot on rye and the grasses, both to man and brute, which would be of great use to the farmer, if he would follow your suggestions in alternating his crops and seed down thick with the more healthful grasses. There is no doubt but the ergot on the grasses produces the hoof-ail in our cattle. I will here give you my treatment of that complaint, which I have never known to fail in a single instance. When I find one of my cattle has this complaint, I put it in the stantials in the stable, then take a mallet and a carpenter's chissel, and set the chissel on the toe of the hoof, three-fourths of an inch from the point of the hoof, then with a brisk blow of the mallet, repeating the blows until the hoof is cut off; if it does not bleed freely, take a thin shaving more, and so continue until the blood runs freely; no matter if the small artery in the point of the toe is cut off, the blood will stop in fifteen or twenty minutes; if the creature should prove refractory, let an assistant take and hold up the opposite foot, which will make it stand firm on the floor, and stand still through the operation; this being done, it is only necessary to keep them in stable two or three days, to keep them out of wet and mud, and in six or eight days the creature will walk about as well as ever. I have never failed in a single instance of effecting a cure on any of my cattle. The sooner it is done the better, as there will be less danger of their freezing, which is worse than the hoof-ail to cure.

In 1836, I raised from one seed of the potato ball 26 potatoes, 14 of which were as large as eggs; last spring I planted the same, and last fall dug a crop of more than two bushels, of a round white potato. How many years will it take to bring them to full maturity?

Yours respectfully, THOMAS PAINE.

Brining Seed Wheat—Cure for Stifle.

Lawrenceville, Tioga co. Pa. Dec. 27, 1838.

Mr. J. BUEL—Dear Sir—I think I may safely say I have discovered the cause of Mr. Hathaway's brined spring wheat not coming up well, to be owing to the smut machine and brining also. This fall, my wheat being somechessy, I took it to the mill to have it screened, and as that and the smutter were connected, the wheat had to pass through both; after which I brined the most of it, from 12 to 18 hours, then limed and sowed immediately.

Not brined or limed came up well, though it had been through the smutter.

Brined 18 hours, then limed, came up badly if smutted.

Brined 18 hours, and having passed the smutter twice, not one kernel came up.

Brined 12 hours and once smutted, came up pretty well.

Brined 18 hours but not smutted, all came up fine.

Inference—the smut mill opens the grain in some way so that the brine kills it.

The grain worm has made its appearance here the past season, though not extensively.

I will here give you a receipt for curing a stifle, which I consider invaluable, and as for its being infallible, I think no man can gainsay it. At any rate, I have cured many horses, and sold the receipt for many dollars, thus:—

A handful of sumach bark and a handful of white oak bark, boiled in a gallon of water, down to two quarts; bathe the stifle with this lotion twice a day for three days; then put on a salve made of the white of an egg and rosin, and bathe the same in with a hot shovel two or three times, and the horse is cured. Yours with esteem and respect, W. KILBURN.

Experiment in the Culture of Rape.

Hill-Side, (near Meadville,)
Crawford co. Pa. Nov. 29, 1838.

J. BUEL—Sir—By referring to vol. 3, p. 110, of the Cultivator, you will find the following remark, in reply to a Mr. Davis, of Saratoga, on the culture of "Rape, colze, or cole seed," viz.:—"An important article in Flemish husbandry, &c. though not at all cultivated in the United States." * * * "As rape is biennial, it is doubtful whether it would withstand the cold of our winters." If of interest to you, I take pleasure in communicating as follows:

Mr. Frederick W. Kockler, of this county, lately imported from Holland, some rape seed; he sowed three-fourths of an acre in August of last year; the produce in seed this year, amounted to twenty bushels, although the seed was not taken at all clean from the stalks, and the land was very illy tilled for this crop, as well as for the previous crops taken from it. The produce would have been thirty bushels undoubtedly, had the crop been properly harvested. The crop was taken in on the 12th day of July. The rape stood the effects of the last severe winter well; it was uninjured, although grown in an exposed situation. According to Mr. K. who is an experienced cultivator of the article, the rape seed is committed to the ground on the 24th August, in Holland—the 12th of August, he thinks late enough for this climate. He thinks that in rich, dry and well wrought soils, no crop could be more profitably cultivated in this country, and in the western states especially. In Holland, they have hard winter freezing, but not much snow, which characteristic corresponds with the climate of some of our western country. The cultivation of this crop, has been successful in some parts of Ohio, and only discontinued from want of oil mills convenient sufficiently to make its culture profitable. The above communication would have been made to you by Mr. K. himself, but he feared that his slight acquaintance with our language, would have made his communication somewhat unintelligible to you and your readers.

If I recollect right, the subject of rape culture is treated of by that enterprising gentleman, Col. John Hare Powel, of Philadelphia, in a communication to the Pennsylvania Agricultural Society, some years since. You probably have the volume of "Transactions," and can by reference discover whether it is of sufficient import to copy. I will mention here, (although foreign to Mr. Kockler's expectation,) that a few bushels, say eight or ten, of the seed, can be had of him, delivered in Meadville, at four or five dollars per bushel, which announcement, I hope, will not injure the usefulness of the intelligence contained in the general statement.—His object in dictating was not to bring his seed into market, but simply to make public his experience, in a branch of agriculture comparatively new in this country, but of great importance to our agricultural interests. Mr. Kockler will take pleasure in communicating his experience in this matter, in both Holland and this country, to any who think it of sufficient consequence to address him on the subject. Respectfully,

JOS. C. G. KENNEDY.

☞ See our remarks under editorial head.

Making Pork.

The business of fattening pork for sale is practised to some extent by many farmers, and when performed economically, it is a source of profit; yet all will admit, when carried on in the manner it often is, it drains instead of replenishing the farmer's pocket. To make fattening swine profitable, it is necessary, in the first place, that the breed of swine should be good. There is a vast difference in swine in the respect of fattening, proper proportion of bone, weight, &c. There are several good breeds of pigs now in the country, and any farmer who is willing to make the effort, may have a lot of fine looking pigs, as well as to have long-nosed, slab-sided fellows. The time has gone by when a pig must be kept four years to weigh four hundred. The business of fattening swine is little understood, and poorly attended to. Pigs a year and a half old should come up to that, and some have exceeded that weight. Next to a good breed, it is necessary that they should be kept in a thriving situation. There must be some foundation for fattening, when the process commences, or much time will be lost, and food consumed, in making a carcass to cover with fat. Swine should have a field allotted to them, so large in proportion to their number, that their grass feed will be fresh. They should have the slops of the kitchen, whey of the dairy, &c. in addition to their grass feed through the summer season. The manner in which their food is prepared and given, has a decided influence on the fattening process, and of course on the aggregate profit. If given out raw, much of the value of the article is lost. Grain is much improved by grinding, but the full value is only brought out by cooking. Corn is the best article for fattening swine; yet there are but few who fatten their swine altogether on corn. I will now inform you of my manner of fattening swine the year past.

My swine were kept in a fine growing state through the summer season; and in the fall I enclosed in dry warm places ten pigs, a year and a half old, with the exception of one two years and a half old. I commenced feeding potatoes boiled dry, and then added the dairy slops. This I continued through the month of September. Then I mixed oats and barley, equal quantities, had it ground into meal, and mixed this with the potatoes boiled, and continued this through the month of October; and then I added corn with the oats and barley, equal quantities, ground together, added to the potatoes, and continued this food until I slaughtered them, which was the 26th of December, and the weight of each was as follows:

1	sow	2½	years old,	535lbs. raised 10 pigs this season.
1	do	1½	do	561lbs.
1	do	1½	do	625lbs. raised 5 pigs this season.
1	do	1½	do	485lbs. raised 3 do
1	do	1½	do	383lbs. raised 3 do
1	barrow	1½	do	445lbs.
1	do	1½	do	425lbs.
1	do	1½	do	519lbs.
1	do	1½	do	456lbs.
1	do	1½	do	516lbs.

Total pounds weight, 4,953

NEWTON WILCOX.

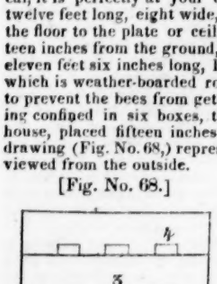
West Winfield, Herkimer co. N. Y. Jan 4, 1839.

Kentucky Bee-House.

Pleasant Hill, November 30, 1838.

Mr. J. BUEL—Dear Sir—As I have sufficient room in this letter, I will give you a description of my father's Bee-House, which I think preferable to any I have seen, on account of its cheapness and convenience, and if you think it worthy of a place in your excellent periodical, it is perfectly at your disposal. The building is twelve feet long, eight wide, and seven feet high from the floor to the plate or ceiling, (the floor being eighteen inches from the ground,) and consists of four posts eleven feet six inches long, let in the ground three feet, which is weather-boarded round, and covered in, so as to prevent the bees from getting in the house, they being confined in six boxes, three on either side of the house, placed fifteen inches one above another. This drawing (Fig. No. 68,) represents one side of the house, viewed from the outside.

[Fig. No. 68.]



[Fig. No. 69.]

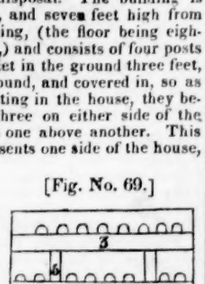


Fig. 68, No. 1, 1, are copper troughs running round the post, half way between the floor and ground, which are kept filled with water, to prevent ants or other insects from getting in the house. No. 2, 3 and 4 are tubes eight inches wide, one-eighth of an inch deep, to convey the bees through the wall into the long boxes, and entering them at bottom, there being three to each long box.

The drawing, Fig. 69, represents one side of the house, viewed from the inside. No. 1, 2 and 3 are long boxes, eighteen inches wide and twelve deep, extending the whole length of the house, with eight holes, four inches square, in each box, upon which is set two gallon caps, with two half inch holes in each, one near the top, the other about the centre of the cap, in which the smoke of a burning rag is blown to drive the bees from the cap into the long box, which can be known by striking the caps. When they are all in the long box, a knife or wire should be drawn under the bottom of the cap, to separate the comb from the box, when the cap of honey may be removed, and an empty one put in its place. No. 4 and 5 are tubes three inches square, to convey the bees from one box to another, that one swarm of bees may do the whole, or if one or more swarms be put in each box, that they may become as one, as they will not permit more than one king when put together, by which they are prevented from destroying themselves by fighting.

A house of this description, when the long boxes are filled, will afford, at a moderate calculation, ninety-six gallons of honey in the comb annually.

F. S FISHER.

Matters of General Interest.

Hartford, Dec. 27, 1838.

My Dear Sir—Minutes, hours, months and years, seem to me much shorter than they once were; formerly, I had leisure enough, or at least thought so, for I have wasted many an hour impatiently waiting for the coming time, and now all my industry avails me little; my good intentions unperformed accumulate from day to day, till nothing short of an expunging process can set me free. I however took good care to wipe away no part of my debt to you, as it involved too much of interest to myself to be otherwise cancelled than by a letter. It is scarce necessary I should express my regret at not meeting you—my endeavours to do so will best testify on that point; that pleasure must now be deferred till February, when I have made my arrangements to be present at the State Agricultural meeting, together with one or two gentlemen from this state. This reminds me of your half promised circular which I have expected with some impatience—I hope you do not feel discouraged, but that an Agricultural School will, ere long, be established; it seems to me the next step to be taken in the path of improvement—its effect will be most beneficial and enduring; and if it be slow it will be silent as well as irresistible in its influences, for they will flow through channels that are less jealously watched and freer from suspicion than any legislative act; for what can be done for the man who cries out "I will die and nobody shall help me"—a blunder, I allow; but not a greater or more fatal one than the Farmer's, when he declares, "I will be ignorant and no one shall instruct me;" and then becomes vociferous about rich and poor, aristocracy and democracy, until the question of his own improvement is dragged into the *political* arena and becomes a question for the people; a field in which ignorance and prejudice can out-number, and therefore successfully array itself against intelligence and science; then comes the damning cry of, "taxing the many to gratify the few," &c. &c.—What profound ignorance! what deep cause of regret, that so *important* and so large a part of our community are so much below the standard of intelligence, found throughout every other portion of the American people. And it does seem to me that the evil cannot be reached through any of the agricultural periodicals; I continually regret that the excellent essays I there find come under the eye of those *only* who *do not* require them, for whom they are *not* intended; while the ignorant and prejudiced never see them, scarcely ever hear of them. Now it does strike me that some more certain and direct way *might* be found of addressing these truths to those who most stand in need of them, for it is not the *readers* of the Cultivator who require to be taught the value of its contents, nor the necessity of such modes of interchanging intelligence, in order to advance the general science and improved practice of agriculture. Enough then, perhaps, has been written *at* (for I cannot say to) the farmer who "don't believe in reading." And I would now rather see some inquiry made, and some suggestions offered, as to the duty of those *who do* see the columns of your valuable paper, whether we are doing our endeavour, each according to his individual capacity, to elevate the agricultural character by a friendly and frequent intercourse with our farming neighbors, however widely they may differ from us in opinion, however much they may despise our book-knowledge? Are we promoting, *all in our power*, exhibitions, meetings, clubs, and other social occasions friendly to that frequent interchange of opinions and views so necessary to progress? Do we make ourselves useful by examples of good culture, by *liberal* interchanges, and by permitting to others the *free* use and trial of such means, implements, and animals as we ourselves are employing for the improvement of our lands, our labor and our stock?—and very much else I would ask if we do, that lays fully within the compass of every individual. Or, do we pursue our own way in *manifest* disgust at the ignorance around us, feeling as though we had nothing in common with them, and making no effort to break down the partition walls of prejudice and contempt that they are every where building up? A quantum sufficit of zeal, with a little liberality towards the necessary funds of societies you wish should prosper will do much towards the desired end.

I often observe comparisons made between the agricultural spirit of this country and England; but to me they seem unfair, in as much as there is an important link not found in this country which in that connects the practical farmer with the very sources of science; I allude, of course, to the large landed proprietor of highly cultivated estates under the management of a numerous tenantry, on whose successful farming and improvements their income depends; there, there is a fostering, and tho' perhaps a selfish, care continually extended towards the cultivator of the English soil, unremitting in its assiduity, and highly influential in its character, the landlord and tenant having one and the same interest. Not that I covet, by any means, the same state of things here; I would merely draw your attention to the unfairness of comparison, and inquire how far we may obtain the same results by different and more desirable means. Take from them this powerful link, and let them drop off from the great chain, and become as the American farmers are, a part and portion by themselves, and you would soon find them even behind us as a community; for it is within my knowledge, that the then called intelligent farmers in England, who were prejudiced against the short horns, held and promulgated the opinion that crosses of the short horns on other breeds produced animals as incapable of breeding as the mule! &c. &c.

Thus you see I would extend, as far as may be possible, to the American farmer, all the *advantages* and *kindly feelings* of an English landlord, without subjecting him or his lands to any of his claims. Should you see with me in this matter, *you* may perhaps be induced to address those who *do* read the Cultivator, and by exciting *them* to greater activity in their respective spheres, at length obtain a reading from *those* who now despise book-farming; and I am strongly disposed to think, that if a farmer will once read, prejudice will give way.

I attach much consequence to the manuals of farming for which premiums have been offered, and I sincerely hope they may be what they ought to be, *and if so*, that such a fund may be raised as will afford them very cheap to the farmer; and from my observation, and I may almost say, intimate knowledge of the unreading farmer, they should be written in that simple plain style that will remove as much as possible all difficulty in reading.

When arranging our premiums, I suggested offering some of our agricultural periodicals as rewards, which was at once acceded to by the society, and I think no less than 20 copies of the Cultivator and Genesee Farmer, were included in the list; but I was sorry to find, that though we had no less than eighty well filled pens, yet there were not claimants for the lower premiums of many of the classes, consequently but three copies of the Cultivator for 1839 were claimed. We preferred awarding a *current* volume, because it would then be received in parts, be more certainly read, and more surely missed at the end of the year. Farmers have but little time to read, and often find that little reading difficult, and a volume would be laid aside while a paper would be read by snatches and at odd times. F.

Remarks—Although the above is extracted from a private letter, not designed for publication, we nevertheless feel justified, after suppressing the writer's name, in applying it to public uses. We will only remark, that it admonishes our great men—be they statesmen or landlords—of the importance of giving their attention to the improvement of our agriculture—as a means both of promoting their individual and the public interest—and it shows the importance of having, in our common school libraries, books upon agriculture, as the best means of eradicating prejudice against useful improvement, and of laying the foundation of substantial usefulness in the the rising generation.—*Con. Cult.*

The Advantages of Capital on worn-out Lands.

Greene county, Va. 17th Dec. 1838.

To get rich, is to enrichen my land.

The above, Mr. Buel, is my motto. Instill this in the minds of the farmers, and the work is half done. And to the present period my motto is pretty well developed. Nine years ago, I came in possesion of my farm by purchase, which is situated at the base of the Blue Ridge. The then state of it was most chilling, but the situation much to my taste; the place, for then it could not be called a farm, no way the eye could be turned, but presented galls, gullies, broomsedge, briers, bushes, and some forty acres of wet land. The latter first engaged my attention. Within the first two years I expended $400 in ditching, and about the same amount since, which has fully come up to my expectations—having put the land in a high state of production. Secret ditches I mostly use in draining, leaving no more open than necessary, which is governed by the length of the ditch, and the quantity of water to be conveyed: if too long—and they should get choked about the source, the work will be all to do over—but this I have never had to do yet. At all times a secret ditch should convey the water; for when all of the chinks of the ditch become full, the water will spout to the surface, and drown the crop, which sometimes happen in long wet spells. My mode of secret ditching, is with rock. All other ways, such as with poles, brush, &c. are ineffectual or but temporary; but I have not yet done draining; the want of means only has retarded this improvement as well as others on my farm. Within the first four or five years of my maiden farming, the expense considerably exceeded the income, so much so, that about the end of that period I had sunk about $1200, more than half of the prime cost of my farm, which is 400 acres. At this time I was much dejected—I endeavoured to make sale, but no body was willing to add the improvements to the first cost, and the consequence was of course no sale. By this movement not a link in the chain was broke. I renewed my efforts, and have the pleasure to say, the sunk fund is all discharged, as well as some eight or ten hundred dollars worth of property acquired besides.

No person that knew my farm at the time I purchased it, but will now agree it is worth four times as much as the prime cost, and I think six times. The galls, gullies, bushes, briers, broomsedge, have all disappeared; also the rock taken off, and put into fencing and secret ditches. Not a spot, of 200 acres in cultivation, but what will produce a good crop of corn or wheat, and a good portion that was literally exhausted, will produce a good crop of tobacco; but that plant I have not yet cultivated, but notwithstanding, I am well satisfied I have increased my property much faster than the largest tobacco growers within my knowledge, in proportion to capital employed. The improvement of my farm now, is much more rapid than a few years past, and under the same management, of course, will annually increase, as well as the profits. This year it clears me about $700, from three hands; you no doubt from the above, and a self made farmer, will think it is coming on very well—and besides I will add, this farm was located upwards of a hundred years previous; of this, there is no doubt—for on a chimney I pulled down, the date of 1746 was marked upon it; and this chimney as tradition tells it, was put up by the second or third settler, and since the builder of that chimney sold it, it has passed through several owners, and all have been compelled to abandon it; and notwithstanding it has been located such a period, not an individual as yet has died the owner of it.

With these few preliminaries I stop and refer to your decision. If they prove fit for your valuable paper, more anon—if not, I will no more mix a goose quill with my ploughing, manuring and clovering, for upon these three things rest my life. Your obedient ser't.

T. G. GARTH.

Experiment in planting corn—Alternation of crops—Mode of applying Gypsum—of fattening Hogs.

Rockingham county, Va. Dec. 25, 1838.

Sir—A friend of mine, last spring, planted a part of his corn at the depth that corn is usually planted in this part of the country, and in another part of his field, he run his planting furrows unusually deep. The land was of uniform quality, and the corn in both parts covered with the common quantity of earth, so that the only difference in planting, consisted in the different depths of the planting furrows. In the early part of the summer, the corn planted in the shallow furrows, grew the best, and promised to make the best crop, but in the latter part of the summer, the season became dry, (the drought was severe,) and then the shallow planted corn began to wither, whilst the deep planted corn kept green, and continued to grow after the other was almost killed by drought, and made in the end greatly more corn. These facts have brought to my attention the question, whether corn should be planted deep or shallow? And by the question, let it be understood, that it is not a question about the depth of earth with which corn shall be covered; but a question about the depth of the furrow. And to this question, I would invite the attention of agriculturists, and request the communication of facts from all who have had any experience in the two modes of planting; as it is by a comparison of many facts only, that we can come to any safe conclusion in agricultural affairs. I have understood, that it is settled, that in the sandy lands and warm climate of South Carolina,

deep planting is best. And if it shall be found that in our more northern climates and clayey soils, deep planting will yield the best crop, there is another advantage attending it, that will recommend it to those who cultivate this valuable grain. Corn that is planted deep is not so easily blown down by winds, and will not be bent and tangled at cutting time, like that which is planted on the surface. As this is a question involving no depth of reasoning or scientific knowledge, it may perhaps be passed over, with less attention than it deserves. But if it be duly considered, it will be found to be a question of interest, and it is hoped that all who can communicate facts, will contribute their aid to a correct settlement of the question. In the case mentioned above, the corn was planted in a sandy soil, of but moderate fertility, and it will occur to all that in experiments which may be detailed, the character of the soil should be given.

Another question of interest to myself, is now forcing itself upon my attention; and I would be glad to hear the opinions of those, whose experience may enable them to speak upon the subject. To state the question more clearly, I will premise that for near twenty years, I have been cultivating a small farm upon the four field system. When it first came to my hands, a part of it, though originally fertile, had been greatly exhausted by bad management, and all my efforts were directed to its improvement. My crops have been corn, wheat, clover, clover, and by a free use of plaster, and some degree of economy in saving manure, my farm is now greatly improved and may be said to be in good heart. The soil is a tolerably stiff clay, based upon what we call blue slate, the rock lying at a good depth below the surface. I have preferred mowing to grazing, and as the hoof is injurious to clay lands, the stock have been kept off the fields as much as possible, when the ground was soft. But little has been sold off the farm except wheat, clover seed, cattle and hogs.

Having but a small farm, and being desirous of cultivating more land than my farm will allow, upon the four field system, I am inclined to divide my land into three shifts, and this forces upon my attention the question, whether I can preserve the degree of fertility which my land has attained, by cultivating corn, wheat, and clover, and letting the clover stand but one year, instead of two. By letting the clover stand two years, the land has improved; and now if it shall stand but one, will the land deteriorate, and will the crop be reduced? Let it be supposed that the corn shall be fed upon the farm; that the clover shall be in part mown, and in part grazed by hogs; and that a reasonable degree of economy shall be used in saving manure.

As he who asks information from others, should be willing to communicate any which he may have, and thereby show his readiness to contribute to the common fund, I will mention, that my practice, has been to sow plaster broad-cast upon corn, instead of putting it on the hill, believing, that at earing time, which is the most important, the roots have spread over the whole surface, and that the plaster being sown broad-cast, will then be in a situation to contribute more to the growth of the corn, than it would be if placed immediately at the stock, as it is the ends of the roots that take up nourishment: and believing, too, that when sown in this way, the plaster will benefit the succeeding wheat crop, and the young clover which shall be growing with the wheat. I have indeed thought, that sometimes the young clover is thereby saved from being killed by drought.

For some years past, my attention has been turned to hogs, and having been successful in my efforts, I will give you my opinions upon that subject. The more common practice with us, is, to let our hogs shift for themselves, or to feed them but sparingly the greater part of the year, and then during the fattening season, to feed them to excess. We then attempt to do that by force, which might previously have been accomplished by an easier and cheaper process. By feeding too sparingly during the winter, the hogs are kept alive only; they do not grow; become stinted, are worth no more in the spring than they were in the fall, frequently not so much, and of course what has been fed has been wasted; and then, during fattening season, they are fed to excess, and loss is sustained by undigested corn. My plan has been to feed well, to start my pigs fat, and to keep them in uniformly good condition. They are always growing and increasing in value; are fed a small quantity of grain when running in clover pasture, and by cutting up corn for them as soon as it is in good roasting ears, they are ready for market, as soon as the weather is cold enough for slaughtering. They are, in this way, fattened during moderate weather, and all agree that hogs fatten faster in moderate than in cold weather. I prefer fattening in a field, to a close pen, and from my observation, I am satisfied the field is the best. The field is used that is intended for the corn the following year. The grass and clover roots which they get, contribute to their health, and save corn, as any one may be convinced, by observing that they will feed a part of the day on the clover, however plentifully they may be fed with corn. If hogs be well fed, and kept *dry*, and *clean*, and *warm* in winter, and be furnished with shade and plenty of water in summer, they will, I think, be always profitable. A good breed should be selected, as some breeds are certainly more profitable than others. The feeding of hogs presents another question of interest, and we ought to inquire, whether clover grazed by hogs, will improve the land as much as if it be grazed by cattle; and whether corn fed to hogs upon a field will improve it as much as if it were fed to cattle. These are questions which I would not undertake to decide from my experience, and upon which I would like to hear the opinions of others. If these inquiries shall receive any attention from the correspondents and readers of the Cultivator, I may be encouraged to trespass again upon your attention.

GEORGE H. CHRISMAN.

On Ashing Seed Wheat—The Poppy a Protection against Insects.

J. Buel—Sir—While living in the State of New-York and being a mechanic, I was a subscriber for the first volume of the Cultivator with which I was much pleased; and now having moved to Michigan, and commencing a new business with which I am unacquainted, I feel the need of instruction in this, (to me) a new branch of business: therefore I have taken the fourth, and am taking the fifth volume, and I want you to send me the sixth, and also, the second and third volumes. I think that I have been more than paid for all the expense in taking the Cultivator, in one small crop of wheat, in as much as that paper instructed me to soak seed wheat in brine, and roll it in lime; but as I had no lime, and as it was impossible to obain clean seed, I soaked it in a strong brine, and then rolled it in wood-ashes, as a substitute for lime, and to my great satisfaction, after sowing very smutty seed, I harvested a clean crop.—And I am convince I that wood-ashes is better than lime to prevent smut; and more, if wheat is soaked in salt-water and rolled in good strong ashes, I venture to say, it will never be troubled with the insect.

And now, Sir, as the grain-worm is spreading its devastation through many parts of our country, and as you have offered a premium of fifty dollars, and the editor of the Yankee Farmer, a premium of thirty dollars, for a preventive of this great destroyer of our wheat crops, I will venture to give the farmers of our country, through your columns, a preventive, or what I think will prevent the wheat-fly from hovering around our wheat crops or any other crop. If the farmer will either in the fall, or early in the spring, sow the common poppy among his wheat, he will not be troubled with the wheat-fly, unless they are invincibles indeed, for I have for twenty years sown poppies in my garden, and where they were, I have not been troubled with fly, bug, nor insect on any vegetable, even in my field among my wortzel and ruta bagas. The common poppies have prevented the ravages of all flies, bugs and insects.—And now, Sir, if I am not entitled to the above premiums, let no man look for them, for if the above is not a preventive, nothing but that power that dispersed the flies in Egypt, will disperse the wheat-flies in America.*

SMITHFIELD BEDEN.

Hadley, Michigan, Dec. 24, 1838.

* Mr. Beden's prescription shall have a fair trial.

EXTRACTS.

[*From the (London) Farmers' Magazine.*]

Essay upon the Breeding of Live Stock, and on the Comparative Influence of the Male and Female Parents in Impressing the Offspring.

By John Boswell, Esq. of Balmuto and Kingcausie.

CONCLUDED.

I would next look a little at the influence the male has in the *ox*. Here, although I still see the male have by far the greatest influence, I would say that there was a shade of difference, perhaps five per cent. less than in the horse. The cow appears to be an animal whose progeny is often much affected by her imagination during the time of conception, or rather during the period when she is in season. We have the most ancient as well as the highest authority for this in the peeled rods of Jacob: and from what my own experience, as well as the information of trustworthy men, has taught me, I am inclined to think that the calf very often takes after the beast that has been jumping on the cow (whether ox or cow) previous to her being taken to the male. One of the most intelligent breeders I have ever met with in Scotland, Mr. Mustard,* an extensive farmer on Sir James Carnegie's estate in Angus, told me a singular fact in regard to what I have now stated. One of his cows chanced to come into season while pasturing on a field which was bounded by that of his neighbors; out of which field an ox jumped, and went with the cow until she was brought home to the bull. The ox was white with black spots, and horned. Mr. Mustard had not a horned beast in his possession, nor one with any white on it. Nevertheless, the produce of the following spring was a black and white calf with horns. I have twice had pure Ayrshire cows, which are uniformly what is called red and white, with horns. The first of those I put to a brown bull without horns; the produce was very dark red, without any white, and polled. The next cow was put to a jet black bull with horns. The first produce was dark red, without any white, and the next was jet black, and also without any white; and in both cases the make of the progeny took greatly after the sire. On settling in the North of Scotland as a farmer, I soon perceived that one of the greatest defects in the cattle was a tendency to be knock-kneed behind, and in my endeavours to get rid of this, I procured a bull from the South of Scotland free from that defect, and with him crossed the best looking cows of the country. I instantly got rid of that narrowness behind observable in all cattle where no attention has been paid to the breed; and, in a few years, by drafting such queys as did not please me, and breeding only from good shaped ones, I made a breed for myself, which I had done before I knew it, for, having one season lost almost all my own calves, I was, in consequence of this misfortune, forced to buy in calves. These were treated in the same way as to food, &c. as my own, yet those from my own cows soon shot far a-head of them, both in size and condition; and on examination of the two sets of animals, an evident superiority of form existed in those of my own, especially in the smallness and beauty of the head, with a prominent eye; and, a fact not hitherto mentioned, that of the tail being one-half less as to thickness than in the unimproved breed, while a wide chest (that unerring sign of a good and quick feeder) was very conspicuous.* It would seem that horns had been given to the cow by Nature, and that the polled breed have been procured by selection of some of those varieties we so often see, as I observe that it more frequently occurs, when a polled bull is put to a horned cow, that the produce resembles the mother in that particular, than when a horned bull is put to a polled cow, when horns are almost always the consequence.† A great many years ago, the present Sir Alexandar Ramsay, of Fasque, brought a few of the Lancashire cattle to Scotland, a breed then much in fashion, and, as every one knows, remarkable for having uncommonly wide spreading horns, and all with some white, especially on the back. These cattle were intermixed with the cows of the country; and when Sir Alexander came to his estate, the cattle were all horned. About that time the polled or dodded cattle came greatly into vogue in Angus; and Sir Alexander purchased, from time to time, jet black polled bulls, so that in a short time all his cows were of this sort. Nevertheless, every year, even to this day, one or two of the calves "cry back" to the Lancashire, having white, and horns; and, what is singular, it is almost invariably in the male that this takes place.

An instance of the influence of the male in the progeny of the cow is narrated by Bewick, the natural historian. He is treating of the original breed of wild cattle which still exists in a few parks belonging to noblemen in the north of England, and in one or two places in Scotland. They are uniformly pure white, with black, or sometimes red ears and noses, and always extremely wild and fierce. At Chillingham Castle, in Northumberland, says Bewick, cows used frequently to be turned into the park when in season, which were covered by the wild bull; and what is strange, the produce from all those cows were uniformly white, with red ears and noses, and greatly partook of the character and qualities of the wild bull. Here, then, is a very strong proof of the influence of the male parent, and others equally strong could be quoted, did I not think it better to pass on to another animal, the *sheep*.

Here the influence of the male parent is most striking. I have stated in a former part of this essay, that I have been in the habit of purchasing a couple of scores of Highland ewes every year, to put to the Bakewell ram. Let us look a little at the characteristics of every breed in a wild, or at least nearly wild state. We find them muscular, active, restless in quest of food, ever in motion, and refusing to lay on fat.‡ Such I found the Highland ewes; they were all small, with black legs and faces, and had horns. On being put to the Bakewell, they produce lambs of a totally different breed from themselves, all having the greatest tendency to get fat, the wild wiry appearance of the Highlanders being entirely gone; and in its place we have a round fleshy animal, resting peaceably in the fields, the desire to break over fences having likewise disappeared; and what is remarkable, not a single lamb is to be found with black legs or a black face, and scarcely one with any sort of horn,§ while all are of a very large size. They thrive remarkably well, any that I have allowed to grow up as an experiment; and I have always found them much more free from disease than either the Bakewell or the black-faced sheep, particularly the rot of the liver, which makes dreadful havoc amongst the Bakewell; nor does it spare the Highlander, especially when put on high keep. I cannot speak much of the appearance produced by a Highland ram with the Bakewell ewe. Being fully convinced of the power of the male on the offspring, I have always accounted it as loss to put a bad male to a high bred female, and have never done so. I have, however, observed, where the country people have purchased high-bred sheep at any sale of mine, and bred from them with the ordinary rams, that the breed very quickly got bad; whereas when a Bakewell ram had been purchased, I have seen a most remarkable change on the quality of the sheep; and in several instances where the ewes had been tolerable from which they had bred, the cross was so nearly resembling a new Leicester, as to deceive any one who was not a thorough judge. As I wish to confine myself to facts which have

* This gentleman's stock are all jet black and polled, and so remarkably alike, that they show much care in attending to the breed.

* "An observation which Dr. Jenner made to me about ten years ago (the truth of which has been since confirmed by my own experience) that no animal whose chest was narrow could easily be made fat, applies particularly to the Merino sheep, which are in general contracted in that part, and is well worth the attention of those who wish to improve this breed."—*Sir J. Sebright*

† An old French writer on agricultural subjects imagines that polled cattle are degenerated. He says, "Meme en Ecosse on trouve la race tres petite, et fort souvent sans cornes."

‡ Look at the hare and the goat, however well fed, they refuse to lay on fat.

§ Some few have a sort of shrivelled horn, which drops off, or more commonly they rub them off in the autumn.

come under my own observation, I shall forbear to mention circumstances which tend to prove the great power in the male as to influence in the progeny of the ewe, as I have them from others; and shall conclude with the *sow*.

The influence of the male in this animal is as great as in the sheep. A few facts will show this. A friend of mine, soon after I commenced farming (thinking, no doubt, to do me a great kindness) made me a present of a sow of the wild species, in pig to a boar of the same sort. She was sent to me by sea, and during the voyage she broke out of the crib into which she had been put; and when the crew attempted to replace her, she attacked them with open mouth, and forced them to take shelter in the rigging. I put her into a high walled field, where she showed every mark of a wild animal, starting off at the least noise, and running very swiftly to some concealment. When the time of littering came near, she set to work, and carried in her mouth great quantities of withered grass and rushes, till she had a heap the size of an ordinary hay-cock. Here she had ten young ones, so concealed that no trace of them could be seen. When the heap was approached, she made a noise something like the bark of a dog, ran furiously to attack the person who had the temerity to invade her abode. In a short time the young ones made their appearance, they were all perfectly alike, being of a red or dark yellow colour, with regular black stripes, like a tiger or zebra, down the sides. As they grew old they became darker, till they resembled the sow, which was of a port-wine colour. When it became necessary to take them, the mother was secured by a noose thrown over her, and the young ones were hunted down by a number of men. When escape was impossible, they gave battle, and offered to bite very furiously.

I now put the old one into confinement, where she had a second litter to one of the pigs, which were in all points like the first. I next put her to a boar of the Duke of Bedford's improved breed. At once the litter had a totally different appearance; the pigs were all different from each other; some had a slight kind of stripe, some none, some were light, some dark. Those which had stripes when littered lost them, and grew lighter in the colour as they grew up. The leg had become shorter, as had the snout. They soon inclined to come out of the inside sty to the feeding trough, when the feeder put meat in it, and would feed while he stood by; and, lastly, they proved much better thrivers, getting very fat, which the old one and all the former pigs refused to do. I gave a neighbor a boar of the first litter which he put to several of the Duke of Bedford's sows, where the change was equally manifest; the zebra stripe, the long snout, and the length of the leg appearing in the whole of the young ones. I was now very sick of the sight of them, and sold them all off.

My stock now consisted of a cross between the Duke of Bedford's and Squire Western's improved Essex, and were as fine as any I ever saw, being as remarkable for tameness and good nature as the sort I have been speaking of were for the contrary. After breeding from these for some years, they at last got such a tendency to get fat that they were entirely lard, and almost useless from being too fat. Pork at this time had declined so much in the market, and the prices were so far from remunerating ones that I parted with my whole stock but one sow at what they would fetch, thinking the first loss the best. From this sow I had two litters (previous to reducing my stock) by the full bred boar. They were like herself, short in the snout, had very small ears, hardly any legs, and were so tame that they would eat a few oats out of the man's hand who fed them. Having now no boar of my own, I had to look out for one; and being informed that a gentleman and neighbor of mine had a pretty good one, I sent a man and cart to beg the loan of him. I chanced to be in my yard when the man returned. My surprise was great when I found he had a beast muzzled and tied down with a quantity of ropes: and, on his being turned into the sty, he proved to be a beast raving and foaming at the mouth, with long legs, a long snout, ears twice the size of the sow, and a long shaggy coat covering lank sides. In short, it looked as if my man had got a hyena out of Mr. Polito's caravan, rather than a boar from my neighbor's farm-yard; and, when put together, they by no means answered to the words of the old song—

> "Oh, sure a pair was never seen
> So justly formed to meet by nature."

The offspring of this alliance was exactly what I expected; the cross had greatly increased the size, the pigs being longer than either of the parents, while much of the boar was to be discovered in them; the snout had considerably lengthened, as had the ears and legs. The whole of my breed were pure white, with hardly any hair on them. The pigs were some black, some spotted and had a sufficient supply of bristles; and above all, they were lively, active, wild things, refusing to come near their food while any one stood by, and had lost much of the tendency to get fat.

I have thus produced facts of the influence of the male on the progeny in the horse, the cow, the sheep, and the sow, and in all I have endeavored to show to the Society, that, whether that parent be the high bred one or not—whether to improve or to deteriorate—it is the *male* which has by far the greatest influence over the offspring. I would still quote one fact more, which has come under my own eye; it is in the common fowl. In the year 1810, I procured a breed of the Malay or Chittagong fowls, and those I crossed once or twice with cocks of the same breed, got from different quarters. In spring 1824, they had been bred from cocks reared at home for three or four years, and were then all dark-coloured, without a white feather, having either black or yellow legs. Most of them resembled a partridge. At this time I learned there was in a farmer's possession a breed of fine Malays, which his brother (a surgeon on board an Indiaman) had brought home. I sent and purchased one. He was what cock-fighters termed "pied," or in other words, had numerous white feathers all over his body, with white legs. From this cock there were bred, in summer 1824, about seventy-eight chicks, of which number seventy-three were either pied or had a great deal of white on them; and a great proportion of them had white legs. Nothing but the influence of the male parents could have done this, for the hens were all gallant hens, not a white feather was to be found amongst them; nor could it have been owing to their ancestors, for they had all pedigree as long as Sir Watkin Williams Wynn.

Thus far have I stated facts which are known to myself and friends only; I would now mention some which are within the reach of all. Let us call to mind the offspring from the mare and the jackass. Is it not obvious to all the influence the male parent has on the mule? Colour, shape of head, ears, and whole body, constitution, even temper, are all derived from the male parent. I had an opportunity of observing the very same effects in the colt from a quagga and a mare, in the possession of the Earl of Morton, at Dalmahoy.—And his lordship, I believe, observed that the same mare, afterwards covered by a horse, retained in the progeny a resemblance to the quagga,* a fact of the most extraordinary nature.† I have been frequently told that a mule got by a horse, with the female ass, is a far superior animal, and retains the mane, with the ears much less, &c; but this is a fact I never could get to the bottom of. I only know it is believed by the Spaniards.‡ Nothing can be more striking than the power of the male in birds. It is well known that bird fanciers, as they are called, put a cock goldfinch to a hen canary, and that way get a strong, beautiful mule-bird, having the greater part in plumage, song, and total appearance of the goldfinch, and showing, to the most trivial observer, that the male had the greatest influence in the progeny. Every one knows that the hen of any bird will lay eggs although no male be permitted to come near her; and that those eggs are only wanting in the vital principle which the impregnation of the male conveys to them. Here, then, we see the female able to make an egg, with yolk and white, shell and every part, just as it ought to be, so that we might, at the first glance, suppose that here, at all events, the female has the greatest influence. But see the change which the male produces. Put a Bantam cock to a large-sized hen, and she will instantly lay a small egg; the chick will be short in the leg, have feathers to the foot, and put on the appearance of the cock; so that it is a frequent complaint where Bantams are kept, that they make the hens lay small eggs and spoil the breed. Reverse the case; put a large dunghill cock to Bantam hens, and instantly they will lay larger eggs, and the chicks will be good sized birds, and the Bantam will have nearly disappeared. Here, then, are a number of facts known to every one, or at least open to be known by every one, clearly proving the influence of the male in some animals; and as I hold it to be an axiom that nature never acts by contraries—never outrages the law clearly fixed in one species, by adopting the opposite course in another;—therefore, as in the case of an equilateral triangle, on the length of one side being given, we can with certainty demonstrate that of the remaining; so, having found these laws to exist in one race of animals, we are entitled to assume that every species is subjected to the self-same rules—the whole bearing in fact the same relation to each other as the radii of a circle.

Now, then, to the point of expediency. Let us suppose that I have formed an erroneous opinion, and that other essayists bring forward counterproof, to shew the power of the female. What difficulties arise in changing the whole females on an extensive farm, while with what ease a new male is procured! Sir John Sebright says, "Many females throw progeny unlike themselves, and it would be wise to try them with a male whose stock is known previous to breeding from them." How should we manage if we found it necessary from this cause to put away a set of females, which we had procured from a great distance, for the very purpose of improving our breed? If proof were required in a thing so plain to common sense, the enormous prices given for males in comparison of females, would show the advantage of getting that sex which can give the breeder a hundred of his offspring in a season in place of one. Another advantage is the letting out the males to hire for the season, a thing greatly to be wished the society would encourage, and give premiums for. The system is productive of the best consequences, a few of which it may be well to bring before the society; and be it remembered that it is only by the male, for a thousand obvious reasons, that it can be done. When a person has bred or purchased a male, he not only does not like to put him away, although he perhaps has found out that he is not well calculated, either as to cross or selection, to suit the females he has to put him to; but from the partiality which we all have for our own, it is ten to one but we think an animal, which, in truth, is of no value, to be a very fine one; and thus the breeder patters on with an inferior animal, instead of year by year selecting such a male for hire as he sees would be best suited to correct the faults of his stock. Look to the good arising in our breed of horses from this system, which in fact public stallions exemplify. Look how the districts in England where the practice of letting bulls and rams by the season exists, have far outstripped the rest of the island in the excellence of the stock which they possess; and let any one say if the benefit resulting from it is not self-evident. If such a thing were to be introduced in Scotland, and I shall hope one day to see it introduced under the patronage of the Highland Society, it ought decidedly to be in the shape of shows or competitions. Then a spirited farmer, or a few neighbors, could join and procure a fine animal at an easy rate: then the ignorant pretending judge would be told the truth by the verdict passed on his property by the public, who would not spare either his veracity or self-conceit; comparison would teach all a better taste and judgment; fine animals would be brought from England, and all parts of the country; and rewards not only of fame, but of emolument, would be conferred on the man who paid the greatest attention to his trade, and consequently brought forward the finest animals. I do not think I can better conclude than by quoting the words of Sir John Sebright, whose ideas on the subject altogether coincide with my own. "There is, perhaps," says he, "no means by which the breed of animals can be so rapidly and so effectually improved, as by its being the particular business of some breeders to provide MALE *animals* for the purpose of letting to hire. No trouble or expense will be spared by those who expect to derive profit, not from the quantity but from the quality of the animals which they breed; the competition which must always exist between breeders of this description will be a never-failing stimulus to exertion.—The common farmer, who seldom sees any stock but his own or that of his neighbors, generally concludes that his have arrived at the summit of perfection. But the breeder, who lets for hire, must frequently submit his own male animals to the inspection of the public, and to the criticism of his rivals, who will certainly not encourage any prejudices he may entertain of their superiority. Thus each, besides the improvement of his stock, will receive a fair remuneration; and every breeder have the means of selecting the male he thinks best calculated for the females he may happen to possess."

I have now, I humbly conceive, shown not only that it is the male parent which is capable of most speedily improving the breed of live stock connected with agriculture, but that *the male is the parent*, from motives of sense and sound polity, which we can alone look to for the improvement of our breed of live stock.

[*From the Journal of the American Institute*]

To the Committee on Silk, American Institute:

GENTLEMEN—The vast importance of the silk culture to our country, and the eagerness of the public to obtain information respecting it, make it the duty of every one engaged in producing a "silk crop," to furnish his quota of knowledge, that thus a mass of practical information may be collected, from which we may go forward with confidence, and gather in the rich harvest which is before us.

With these views, and in compliance with the solicitation of my fellow-citizens, I give you the result of my experience during the past summer. I would first premise, that in making a trial of the silk culture, it was my desire to adopt a mode which could be followed by our agriculturists at large, rather than to show the greatest possible quantity of silk that could be produced from a given portion of land. Such an experiment, made under peculiar advantages of soil and culture, yielding a large product, might be viewed with admiration, but the means being beyond the reach of the mass of our citizens, the same results could not be attained.

The field from which the experiment was made, was situated in East-Hartford—the soil, of a light sandy nature, of a quality termed in that quarter, good corn land. It was ploughed about the middle of May, and harrowed and furrowed in the usual manner. The roots and trees (Morus Multicaulis,) were now laid down, and covered from two to four inches, the tops having a slight upward inclination; they were placed about twelve inches apart in the row, the rows three and a half feet apart, having been previously moderately manured.

After the field was planted, a section comprising one eighth of an acre was marked off, to be subjected to a more particular experiment. It was stocked with 780 roots and trees, all of one year's growth, having had their tops partially or wholly killed by the severity of the past season. One-third were two feet high, one-third one foot, stripped of their limbs, and the remainder were roots without tops. By the first of June, the new shoots began to show themselves, and by the first of July, they numbered 4,800, and had attained the height of twelve to eighteen inches.

A family of 4,000 worms was now started, which wound up on the 23d July, having consumed 131 lbs. leaves. Three other lots, amounting in all to 28,000, were now put out at intervals of several days, in order to favor the increasing growth of the leaves. By the 10th of September, the last had finished their labors.

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* The quagga is the species which links the zebra and the ass.

† An account of the circumstance alluded to by the author is given by the late Lord Morton, in the Phil. Trans. for 1821, p. 21.—(EDIT.)

‡ If a mule be remarked in Spain as particularly neat and handsome, the muleteer will always say, "Si, signor, caballo estavo, padre:" Yes, sir, a horse was his father.

Weight of leaves consumed in August, 701 lbs. and in September, 332 lbs.

Total weight of leaves gathered,..... 1,164 lbs.
Total number of worms fed,..... 32,000
Producing nine bushels cocoons.
Yielding (so far as reeled,) 1 lb. of silk per bushel.
Weight of cocoons,..... 95 lbs.
Waste silk and floss,..... 1 lb.

Twenty-seven thousand of the worms were of the two crop kind, requiring 4,000 to make a pound of silk, and consuming 144 lbs. of leaves. The remaining 5,000 were of the long crop six weeks worms, 2,500 of which produced a pound of silk, and consumed 90 lbs. leaves. It was my intention to have fed the long crop worms entirely, as they are known to be much the most productive of any other kind, but they could not be procured.

Business now calling me away, the feeding was discontinued, and the trees were immediately removed from the ground, having attained an average height of 4½ feet, well rooted and with heavy limbs.

The produce of the one-eighth of an acre, as above, it appears is nine bushels cocoons, or nine pounds silk; being at the rate of 72 lbs. per acre, from the feeding between the first July and the 10th September. It is easy to see, that had the 1,164 lbs. leaves been fed to worms of the six weeks kind, the yield would have been 13 lbs. of silk, or nearly—and from the rapidity with which the new leaves were developing when the trees were removed, it is presumed that had they remained during September, enough more might have been added to have swelled the product, so as to have made the crop at the rate of 125 lbs. per acre.

During the period of feeding, the safety and even advantage to the tree of frequent defoliation was fully proved. The trees from which this experiment was made, were stripped of their leaves four different times, yet at no time were they inferior to others that were untouched; on the contrary, it was remarked, that where the leaves were removed, the limbs shot forth with greater vigor—care being taken to leave the tender leaves at the ends of the branches.

The very great advantage of this species of mulberry over standard trees, was manifest; while such trees are difficult of access, and from the small size of the leaves, requiring much labor to gather any quantity, it was easy for a child to take from the Morus Multicaulis 15 to 20 lbs. in an hour.

The plan of retarding the hatching of the eggs by keeping them in an ice-house, was found perfectly successful; the worms which wound the finest cocoons were thus kept back until the 3d of August.

It may be useful to new beginners to know, that the large six weeks worm, either white or sulphur coloured, is altogether preferable to the two crop; for, not only are they more productive of silk, but from their superior length of thread, the reeler is able to produce silk of better quality, and with less labor.

The convenience of a shrub tree, where the farmer wishes to change his crop, may be seen from the fact, that with the use of a plough, the trees on this section of land, 4,800 in number, were turned out of the ground in 30 minutes. An hour more was sufficient to cart them from the field.

Every one who takes up the culture of silk, is surprised at the ease and certainty with which it is produced; and of this experiment it may be observed, that none of the persons who took care of the trees, gathered the leaves, or fed the worms, had ever seen a tree or a silk worm before.

I am not acquainted with the comparative merits of the Morus Multicaulis, and other kinds of the mulberry; but large as has been the estimate of some cultivators, of the produce and value of the former, I believe its astonishing power of reproducing foliage, its tenacity of life, and the great ease with which it is multiplied, have never been overrated. A friend informs me, that a field of roots, deprived of their tops last fall, remained in the ground during winter, and that from the new shoots, which started as early as any other vegetation, he was able to feed from one to two months earlier than from others planted the following May.—From these collected facts, we may form an idea of the quantity of leaves, and the consequent weight of silk that may be obtained from the Morus Multicaulis, when it shall have attained greater age, even in this latitude.

I am not able to name the cost of raising silk; but an intelligent culturist of my acquaintance, from a proof of three successive years, rates it at $2 per lb. exclusive of the cost of trees and the tillage; respecting the latter, I am of opinion the labor bestowed on a field of mulberry, need not be more than on a field of Indian corn.

It appears, therefore, that nearly all the labor of raising silk, viz: plucking the leaves, feeding the worms, and reeling it into sowings, may be performed by the females of a family, and thus the product be considered a clear gain, like that of any other collateral branch of farming. The growing of silk needs but to be looked into, to be appreciated; and if 100 lbs. can be produced the first year of planting, worth $5 the pound in raw silk, or $9 when in sewings, what other crop, it may be asked, can be named coming near it for profit?

I will only add, gentlemen, that it is cheering to see the interest the American Institute has taken in this all-important subject, and to express the hope, that the coming exhibition, from our silk growers, and the increased patronage of the Institute, may give to it a fresh interest. Yours respectfully, J. DANFORTH.

Hartford, Sept. 19th, 1838.

New Publication.

We have received from the respected author, W. H. Ellsworth, of Lafayette, Indiana, a pamphlet of some 200 pages, entitled, "The Valley of the Upper Wabash, Indiana, with hints on its agricultural advantages;" illustrated with a map, engravings of labor saving machines, &c. Mr Ellsworth is a gentleman every way competent to the task he has undertaken, and his book has conferred a signal favor on the northern part of the flourishing state of Indiana. Hitherto the northern part of that state has been a terra incognita, and while the stream of emigration has flowed along its borders to Michigan and Chicago, few comparatively, owing to difficulty of communication, have found their way into that fertile section of the west, the Wabash Valley.—That difficulty is now overcome, or will be so in the course of the next year, by the completion of the Erie and Wabash canal, which commences near Toledo, at the mouth of the Maumee, and terminates at Lafayette, the head of steamboat navigation on the Wabash.

Mr. Ellsworth has drawn his picture of that section of the great west, in strong and bright colours, but perhaps not stronger than facts would fully justify. It is a country in which corn, the sugar beet, and the mulberry, can be cultivated with as great success as in any part of the United States, and its general agricultural advantages, can scarcely be exceeded, when fertility of soil and ease of cultivation are considered. The excellent report made by Mr. Ruggles to our legislature at its last session, has furnished Mr. Ellsworth with valuable matter for his appendix, and he has also furnished extracts from the letters of other gentlemen, on points that had not fallen under his personal notice. Mr. Ellsworth gives tables and statements showing conclusively that the great thoroughfare to the west, both for travel and trade, lies through New-York; but at the same time demonstrates that this great state must not relax its exertions in the cause of internal improvement, if she would maintain her present high vantage ground. We may refer to Mr. Ellsworth's book hereafter, in the mean time we cordially recommend it to the notice of emigrants to the Mississippi Valley.—*Genesee Farmer.*

An Address

Delivered before the Rockbridge Agricultural Society, at its Annual Fair, Oct 11th, 1838, by GEORGE D. ARMSTRONG, A. M. *Professor of Natural Philosophy and Chemistry, in Washington College, Lexington, Va.*

Communicated for publication in the Farmers' Register.

Gentlemen of the Agricultural Society—The subject which I have selected as affording a theme suitable for the present occasion, is—the value of natural science to the farmer. The practical rules of agriculture, and the best methods of cultivating the great staples of our country, would have afforded a more appropriate subject, had I felt myself competent to the task. But with my imperfect acquaintance with those matters, any attempt to communicate information to the members of this society, must have proved worse than useless. The importance of agriculture to the prosperity of our country, and the honor which is due to the independent American farmer, would have afforded a theme in the highest degree grateful to my feelings; but its discussion could not have been of any real value. In such a country, and in such a state of society as ours, where the farming part of the community are acknowledged to be "the bone and sinew of our strength," that class upon whom more than upon all others, our national prosperity depends, the poor tribute of my praise, could neither make them more honored in fact, nor to feel themselves so. Precluded as I am from the discussion of either of these subjects, which would have been most appropriate to the occasion, I will be pardoned for selecting a theme, which in other circumstances I should have left untouched.

The system of agriculture pursued in this section of country has, within a few years, undergone a change for the better. Whilst a country is new, presenting a deep rich soil, which has never been vexed for the support of man, it makes comparatively little difference in what manner it is tilled. All that is necessary is, to bury the seed in the earth, and in due time to gather home the golden harvest. But if a careless system of agriculture be pursued for a time, the soil becomes gradually exhausted. Instead of gathering an abundant crop almost without labor, the farmer is compelled "to eat his bread in the sweat of his brow." From year to year, whilst the amount of his necessary labor is increased, the return for those labors becomes more and more scanty; until at length a point is reached at which the only alternative left him, is to change his system of cultivation, to emigrate, or to starve. There are portions of our southern country which have nearly reached this point—and the tide of emigration is fast sweeping off their old population to the new countries of the west and southwest, those lands of promise. Accustomed for many years to a certain routine of farming operations, they either would not, or they knew not how to change it for a better. The valley of Virginia, possessing as it does a soil which it is difficult if not impossible entirely to exhaust, has never become impoverished to such an extent; yet, even from the valley of Virginia, not a few have sought a home in the distant forests of the west. Far be it from me to call in question, either the policy of such a movement, or the patriotism of those who have made it; doubtless they have found a richer soil; and having carried our free institutions with them, wherever they have gone, they still possess all that which most endears his native state to the bosom of a Virginian. But those who remain behind, have a work to perform. By long cultivation, the soil has become so much exhausted, that it is necessary for our systems of cultivation to be improved, if we wish still to see "smiling plenty reign in the home of our childhood." Instead of making it the one absorbing question, how can I get the largest return from my lands this year? our farmers must inquire, how can I get the largest return in a series of years? how can I permanently improve my lands? This I suppose every one is ready to admit; but then the question arises, how is this change for the better to be effected? in what way are our lands to be improved? in what respects ought our systems of cultivation to be changed? It is not difficult to mention some way in which lands may be improved, and some particulars in which our systems of cultivation might be changed for the better; but to give a correct and full answer to these questions, to state in what manner lands may be permanently improved to the best advantage, and how our systems of cultivation may be changed, so that a given portion of land shall yield the largest return, with most certainty, least labor, least detriment to the soil, is a task which it is impossible to perform at the present day; and we can hope to do it only after long-continued and careful study of the subject.

It is at this point that natural science may be advantageously introduced to assist us in our labors. I know that in time past, while men have acknowledged the importance of applying science to the arts, and in fact to almost every thing else, they have doubted the value of its application to agriculture. Is this a reasonable doubt? What do we mean by natural science? As I understand it, we mean nothing more nor less, than our knowledge of nature arranged and generalized. Our knowledge on all subjects is, in the first instance, a knowledge of individual facts. After a stock of facts has accumulated, we perceive that many of them are of the same character; these we class together, and include them under a general statement. Again, we observe that some of these facts bear to others the relation of cause to effect, and we arrange them in accordance with this observation. This once accomplished, our knowledge has become science. By this process, the form, and not the nature of our knowledge is changed. Scientific principles are nothing more than human knowledge packed up in a portable form. Founded as they are upon our observation of nature, their application to the affairs of life, is one of the very best methods of testing their truth.

To the arts, and to almost every other business of life, natural science has been applied with the happiest result; and is there any thing which forbids the hope of its being applied to agriculture with equal success?—There are departments of physical science, which apply as naturally and as directly to the business of the farmer, as mechanical or chemical philosophy do to the business of the artizan. Such are mineralogy, geology, and vegetable physiology. One great object of mineralogy and geology is to enable us to determine the character of soils, to ascertain the elements which enter into their composition, and the proportions in which they severally enter. No one has ever doubted that the difference between a fertile and barren soil, lies in a difference in their composition. There are some combinations of the elements of soil, which seem particularly adapted to the growth of plants, whilst there are others which will scarcely support a scanty vegetation. A piece of land may be rendered barren, either by the absence of some one or more of the elements of good soil, or by the presence of some noxious principle. If the former is the case, it is to the interest of the possessor to supply the deficiency; if the latter, to remove the noxious principle. But how shall he set about this work, unless he know whether it is the absence or the presence of an element which renders his land barren, and also what that element is? Lime and vegetable matter are our two most common manures. To make it a general question, as has sometimes been done, whether lime or vegetable matter is the best manure for land, is very much like making it a general question, whether fire or water is the best agent for doing work. Unless the nature of the work to be done is specified, it is impossible to answer the question. For smelting iron, fire is the best, and water is good for nothing; for removing a stain from linen, water is the best, and fire is good for nothing. So it is with respect to manuring; it is necessary that we should know the nature of the soil, before we can determine the proper method of improving it. It is (as I have already mentioned,) one great object of mineralogy and geology to enable us to ascertain the nature of soils; the former, teaching us to distinguish them by their external characters, the latter by their position.

Let this suffice for mineralogy and geology—I wish to direct your attention mainly to vegetable physiology; a department of natural science, which has hitherto been little valued and little understood; and yet one which applies more directly to agriculture than any other. Under the title of vegetable physiology, is comprehended whatever is known respecting the structure of plants, and the history of vegetable life; embracing our knowledge of the nature of the organs of plants, the offices these organs perform, the manner in which they perform these offices, and the changes which they naturally undergo, or which they may be made to undergo by the art of man. Its object is to lay open the machinery of vegetable life, and to explain the manner in which that machinery operates. In order the more distinctly to illustrate the application of such knowledge to practical

agriculture, I will select that which concerns one subject, viz: the circulation of the sap. We all know that plants are nourished by their sap, just as animals are by the blood which circulates through their veins.

If we inquire for the point at which the sap enters a plant, we find it to be the root, but not all parts of the root alike. There is a peculiar class of organs whose office it is to absorb nourishment from the soil; and these are situated along the fibres or smaller subdivisions of the root; of course it is at these points and no others that the sap enters. Let us see if we can make any practical application of this knowledge. If we wish by manuring, to assist the growth of a tree, we should place the manure at some distance from the point at which the trunk enters the ground, so that it may lie as nearly as possible over the fibres of the root. If we wish to plant a vine so as to twine around a tree and be supported by it, we should plant it very near to the point at which that tree enters the ground, rather than at the distance of several feet from it; because in this way the two will interfere least with each other's growth. If we wish to transplant a tree, we should be more careful about the extremities, than about the main divisions of the root. If the root have several branches, it is better to cut off all those branches excepting one, and retain that with all its subdivisions perfect, than to cut off the ends of all the branches, as is the common practice.

Again—if we trace the course of the sap during the different seasons of the year, we find that in such trees as the oak, the hickory and the chestnut, it circulates principally in the sapwood during the spring and summer, but during the autumn and winter it retires to the heart-wood, and not to the root, as is generally supposed. In order to satisfy ourselves of this, nothing more is necessary than to take a part of the body of a small tree cut in the spring, and of another cut in the winter, and lay them on the fire. The sap will be seen to exude in the first from near the surface; in the second from the heart. Let us see if we can make any practical application of this knowledge. It is generally acknowledged that, that most destructive disease in timber called the dry-rot arises from the presence of the sap. It is generally the heart-wood which we use for timber, whilst the sap-wood is considered of little value. If then the situation of the sap at different seasons is such as I have just mentioned, in order to get our timber free from the sap, we should cut it in the summer and not in the winter. The course thus indicated is, I know, in direct opposition to the common practice of men. As this is a matter of some practical importance, permit me to cite one fact in confirmation of the rule which I have laid down. The fact is mentioned in connexion with many others of a similar character, in a communication from a very intelligent ship-carpenter to one of our scientific periodicals. "In accordance with the common practice of ship-carpenters, I was in the habit of cutting my timber in the winter.—During the summer of 1810, when engaged in framing a vesssel, I found I had no piece which was suitable for a certain place in the frame. It was necessary that the work should go on, and as the only alternative left me, I sent immediately to the woods and had a suitable stick cut; this I framed in with the others. After several years the vessel was sent back to me to be repaired.—On examining her side-timbers, I found them all more or less affected with the rot, excepting this one, whilst it was perfectly sound."

Again; if we inquire into the nature of the sap, we find that as it enters the vegetable system, it consists mainly of water holding carbonic acid gas in solution Water has the power of absorbing large quantities of certain gases, whenever it is brought in contact with them. Strange as it may seem to those who have never thought much on the subject, water is porous, and absorbs these gases just as a sponge absorbs water.—The great object of manuring, in most instances, is to supply carbonic acid gas to the growing plant. A large portion of this gas is liberated from vegetable matter during its decay; and hence the value of such matter as manure. The gas furnished by the manure, must be absorbed by the water, as it sinks down into the ground. Of course, the water should meet the manure before reaching the roots, and not after it has passed beyond them. This would suggest that the manure could be placed to the best advantage upon the surface, because then the water must pass through it before meeting with any of the roots. But, then, there is a difficulty arising from another source. The valuable material furnished by the manure, is furnished in the form of a gas. If the manure is placed upon the surface, it soon dries, and whilst in that state, as the gas is liberated, no water being present to absorb it, it is soon dissipated in the atmosphere. The two facts taken in connexion, suggest that the manure should be placed as near the surface as is consistent with its being kept in a moist state, and in every instance, above the roots of the plant which it is intended to benefit. Where manure is spread upon the ground in the fall to benefit a winter crop, it should be placed very near to, if not upon the surface; where it is spread in the spring or early part of summer it should be always covered with earth.

Our knowledge of the nature of sap, enables us to explain the manner in which clover improves land.—Had we no experience on the subject, it would seem, to say the least, improbable that any crop could improve land. We would naturally suppose that plants were nourished by the ground itself—that they fed upon the soil. If such be the case, when a crop is ploughed under and decays, it can give nothing but what it has first taken; and how then can it improve land?—Yet we find that growing clover upon land, and then ploughing it under and suffering it to decay, is one of the very best methods of improving land. Bearing in mind the nature of the food of plants, this admits of a simple explanation. We will suppose that clover is sown upon a perfectly barren spot. The atmosphere which is above this spot, contains a portion of carbonic acid gas, for all atmospheric air contains a greater or less portion of it. A rain comes; as the rain falls, it absorbs a portion of this gas, and in this condition enters the ground. No sooner does it come in contact, with the seed in the first instance and with the root afterwards, than it is absorbed and its materials used for increasing the size of the vegetable structure. When the portion of air above the spot, has in this way been exhausted of carbonic acid, a supply is obtained from the neighboring portions, in consequence of that strong tendency which gases manifest, to intermix and diffuse themselves throughout each other. This process is repeated again and again, and thus the clover increases in size. Perhaps some one may ask, from whence is this gas obtained in the first place? From many sources, but principally from decaying vegetables, such as are found in the woods and along the fence sides. The quantity of the several elements which enter into the composition of our globe, is fixed; it is impossible for man either to increase or diminish this quantity, and it is equally impossible for him to convert one of these elements into another. All he can do is to make an economical use of that which already exists, to gather up those portions which subserve no valuable ends, and apply them to use. This is what the farmer does in sowing his land with clover. He impresses the very wind into his service, for every wind that sweeps over a field of clover, laden as that wind is with the materials of vegetable structures, is made to contribute to its growth. After a large portion of vegetable matter has, in this way, been collected upon the once barren spot, it is ploughed under and secured for future use.

Again; in absorbing nourishment from the earth, the roots of a plant do not seem to exercise any choice; but drink up every thing, presented to them in a sufficiently fluid state. This we learn from actual experiment. Almost any substance which is soluble in water, may be made to enter vegetable systems. After a heterogeneous mass is thus taken up by a plant, such portions as are suited to its nourishment are retained, whilst such as are not suited, are returned to the roots, and by them again deposited in the soil. From observation, we learn that the matter thus rejected, is thrown back in such a state as to be not only unsuitable to the nourishment of the plant (rejecting it) but positively deleterious. It has also been ascertained, that the substances rejected by different plants differ from each other; and this to such an extent that the matter rejected by one plant, is well adapted to the nourishment of another. With a knowledge of these facts, we can assign the reason, why it is not a good plan to sow the same crop upon the same piece of land for several years in succession. It will not do to say (as is often done) that a second crop of wheat will not grow as well upon the same spot, as the first, because that spot has been so much exhausted by the first. This is, it is true, one reason; but if it be the only reason, or even the principal reason, why is it that a crop of corn succeeds so well? The failure in the second crop of wheat, arises not so much from the exhaustion of the soil, as from that soil's containing a portion of matter positively deleterious to the growth of wheat, and which was deposited by the first crop. At the same time this matter is not injurious to the growth of corn, and hence the crop of corn is almost as good as it would have been, had wheat never been sown upon the land. If we could ascertain the precise character of the matter which is retained, and of that which is rejected, by each of the several crops commonly cultivated, it would be an easy matter to determine the best order in which crops can succeed each other. Perhaps too, if this subject was better understood, we should find that the way in which some manures benefit crops, is not by supplying nutritious matter to them, but by removing this deleterious matter from their roots. If this matter possess the character of an acid, as it is more than probable it does in some cases, lime would act in this way. Being a saleable base, it would unite with the acid and neutralize its properties.

I might go on and multiply instances such as these, did the occasion call for it: but as my object is, not to give a lecture on vegetable physiology; but by illustrating its application to agriculture, to show its importance to the farmer, these will suffice. Perhaps some one may ask, if scientific principles are nothing more than facts, arranged and generalized, why is it, that knowledge in this form, is more valuable, than in the form of unconnected observations; the form in which this knowledge is at first obtained?

There are several reasons. Knowledge in the form of science is more easily retained, and is more perfectly at the command of the possessor, than it can possibly be, in the form of unconnected observations. I doubt not that the experience of every one here will confirm the statement, that it is easier to remember fifty effects, when we can trace them to one common cause, than it is to remember five, when we can trace them to no cause. A knowledge of the cause of any number of effects, serves as a band, by which they are bound in one common bundle, and thus secured from being scattered and lost. It is one of the characteristics of science, that the relation between cause and effect is distinctly traced out.

Another reason why it is desirable to have our knowledge in the form of science is, that in this form it will serve to direct us in our course of experiment and observation. Such is the constitution of nature, so intimately are the various parts of creation interwoven, that a cause generally gives rise to several effects.—When we have traced an observed effect back to its cause, we can generally infer other effects, which will spring from the same cause; and these often of a character entirely different from the one first observed. To illustrate my meaning by an instance. In attempting to sink a pump to an uncommon depth, it was found that the water could not be raised by it, to a height greater than thirty-two feet. The cause of the rise of the water was ascertained to be the weight of the atmosphere. The reason why the water would not rise to a heighth greater than 32 feet, was that the weight of a column of our atmosphere was only equal to that of a column of water of the same diameter, and 32 feet high. It was at once inferred, that as the weight of the atmosphere was fixed, it must sustain columns of different liquids at heights, inversely proportioned to their specific gravities. And again; that as we rose from the level of the sea, leaving as we must, a part of this atmosphere behind us, the height at which a column of any liquid would be sustained, must diminish in proportion to our rise. Thus by tracing the refusal of a pump to act in certain circumstances, to its cause; we ascertain, in the first place, a method of determining the specific gravity of liquids; and in the second place, a method of determining the height of mountains. The effects by which we determine these things, spring from the same cause as the refusal of a pump to act, and yet they are of such a character that we never should have dreamed that there was any connexion between them, had we not traced them to their common cause; and more than this, we should probably have remained long in ignorance of the two last mentioned effects, had we not traced the first to its cause. Thus it is, that throwing knowledge into the form of science, is like putting it out at compound interest.

Another reason why it is important to have our knowledge in the form of science, is that in this form it will greatly assist us in observing facts, and collecting information. When the attention has been directed to any particular subject, facts connected with that subject are observed and remembered, which, in other circumstances, although they might have passed before the eye, would have made no impression on the mind.—Let a farmer and an architect travel together, through the same country, you will find that although they must have seen the same things, yet they have brought home with them entirely different kinds of information. The farmer can give you an account of the soil, the condition of the crops, the methods of cultivation, &c.; whilst he can tell you little or nothing of the structure of the buildings which he has passed. The architect, on the other hand, can give you a minute description of every principal building on the way, whilst he can tell you little or nothing respecting the crops. The difference arises entirely from the fact, that these two men have had their attention previously directed to different subjects. By throwing our knowledge into the form of scientific principles, we get a number of subjects worthy of attention, distinctly out before the mind, and each of them will be a nucleus around which knowledge will naturally collect.

Such are some of the arguments, which urge a study of natural science upon the farmer. The want of success, which has in many instances attended the efforts to apply science to agriculture, may be brought forward as an objection, by some. To such I would answer, this want of success is to be attributed, in part to the present imperfection of those sciences which most naturally apply to agriculture; and in part also, to the visionary character of many of those who have hitherto made the attempt. If you will consult the history of the application of science to those of the arts to which it has been most successfully applied, you will find that this has been a misfortune which has happened to them all, in their infancy. Visionary men being the lightest part of society, seem always to rise to the top; and rising science, like the rising sun, is forced to shed its first rays upon those barren spots, where it is impossible that any thing should grow. Let it rise higher, and pour its flood of light upon the rich valleys below, and if it cause not these to spring with life and verdure, then may you fairly call its claim in question. If the attempt has failed hitherto, in consequence of having been made by visionary men, the greater is the necessity that sober, substantial, practical men should now take the matter in hand.

Much has already been done in Virginia for the advancement of the interests of agriculture. A geological survey of the state is now in progress. An able periodical, devoted exclusively to diffusing information respecting the best methods of cultivating and improving land, has been established, and thus far well sustained. And last, though not least, societies such as that whose anniversary we to-day celebrate, have been established in many parts of the state. Thus far it is well. There is yet another, and, as it appears to me, an important step to be taken. The nature of that step and my reasons for believing it important, I have presented before you. "I have spoken as unto wise men, judge ye what I say."

Every inducement is held out to the farmer of the valley to improve his land and his system of culturation.

Who that looks upon the inexhaustible water-power of our state, and at her vast mineral resources; the iron and the coal, which the hand of a bounteous Creator has so lavishly bestowed upon her, can doubt, that she is yet to become one of the principal manufacturing states of the union. Thus will she possess within herself a market for all that her farmers can produce by the most skilful cultivation. The James River improvement will soon open a grand highway, from the valley to the very centre of this market. Our climate is well adapted to the growth of every species of grain; our soil is already good, and susceptible of the highest degree of improvement. What then is there to forbid the hope, that the valley of Virginia may yet rival in fertility the fairest portions of the west? Let our farmers but improve the advantages which they have; let them engage in earnest in the work, and this hope must soon become a reality.

The traveller as he rests for a moment on the top of yonder mountains, will cast his eye over a broad land of golden harvest. As he descends and mingles amongst us he will receive the hospitality of an intelligent, a blest, a happy people. The inhabitant of the valley has already much to rejoice in. He trembles not before the chill wind of the north, neither is he stricken down under the oppressive heat of the south; surrounded by a scenery so grand and beautiful, that no part of the country can boast of a superior; possessed of a mountgirt home, such as has always been the strong hold of the freeman, let him but add to these, that fertility which he can bestow upon the soil, and with an honest pride may he exclaim, my own, my native valley, is the fairest spot on which the sun shines.

Science of Gardening—CONTINUED.

[*From the Alphabet of Gardening.*]

SCIENTIFIC PRINCIPLES OF DIGGING AND RAKING.

It must be evident that a soil having a hard crust on the surface, will neither admit water and air, nor allow the water and air already below the surface to escape and circulate freely—circumstances indispensable to the healthy growth of plants. It is with such views, as well as to render it more easy for plants to extend their roots in search of food, that digging is performed. The extraordinary effect thereby produced is strikingly shown by the experiments of Mr. Curwen, who found that the quantity of water which rose in the form of vapour from an undug surface was exceedingly small, whereas from an acre well labored there were no less than 950 pints carried off into the air in one hour.

So great a loss of water might, however, be in many gardens injurious, by rendering the soil too dry, and, in that case, it might be useful to employ the roller when the plants would admit of this, or place fern leaves, or the like, so as to prevent too rapid a loss of water.

Raking very smooth will have a similar effect, by diminishing the extent of the surface exposed; and hence where there is too much moisture, smooth raking must be bad practice, and rough digging or trenching the best for sending off the superabundant moisture into the air.

When a soil is what is popularly termed *sour*, that is, too moist in consequence of water lodging in it without free circulation, it is often advantageous to turn it over by repeated rough digging, going as deep as it may be advisable, according to the quality of the under soil. This indeed is always of importance in regulating the operation of digging; for otherwise, if the upper soil is rich in the materials of the food of plants, it may be turned too deep for the roots to feed upon it, while if the under soil is the richer in the food of plants, it will be useful to bring it up from some depth to the surface. The testing of the soil to be dug, at various depths, will therefore be always important before proceeding. Dr. Home, as we have seen, found barren under soil or *till* usually impregnated with iron.

ACTION OF FROST ON SOILS.

Very erroneous notions, it would appear, are commonly held respecting the action of frost upon soils, which it may be well to examine here. Even scientific men have concluded, that frost, by crystalizing the water retained in clay soils, tends to loosen it, by separating the particles; all which seems very plausible, but plain facts and experience demolish the theory. Instead of being expanded, and the particles separated from the swelling of the ice accordingly, it is found, that wet clay squeezes out the water to the surface, while the particles of the clay become more tenacious, solid, and close; the process being similar to what takes place upon freezing salt dissolved in water, in which case, all the salt is forced either into the centre, or into separate solid masses surrounded by ice. This view is farther proved by the well known fact of newly transplanted strawberries, and the smaller pebbles on a garden walk being loosened and thrown out by the frost squeezing the soil more firmly around their lower bevelled parts, from the action of which they escape gradually upwards; whereas the larger pebbles on a gravel walk will, in slight frosts, be seen to sink a little, from the pressure caused by the frost not being below them. It will hence be injudicious to rough dig a stiff or watery clay soil with the view of mellowing it by frost, and still more to expose clay intended for composts to freezing. An ample dressing of fresh farm-yard dung, containing much straw, or of wood or coal-ashes, will answer much better with such a soil, from the straw facilitating the introduction of air, and the circulation of water, and the ashes separating the particles of clay. Dressing clay with sand, at least in any small quantity, which has been recommended, will only tend to stiffen the clay, as must be evident from the processes of brick and porcelain making, in which sand is indispensable to mix with clay to harden the goods. In order to be beneficial, the sand must be in proportion of at least one half, or more, to the clay.

I may mention here, also, that the common notion of frost tending to kill insects, is far from correct.

LEVELLING AND DRAINING.

One of the most important things effected by digging is the levelling of the surface in cases where the soil is very light, and liable to become parched for want of a sufficient supply of moisture; for the sun, having less effect upon a level surface, because the rays of light run in straight lines from the sun, will not carry off so much water as from a slope. By the same principle, when a soil is too wet and cold, the forming of the garden into a slope, if the expense can be afforded, will be of great advantage.

Although draining is rather extensively practised, I question whether its principles are sufficiently understood; for it is obvious, from what I have already detailed, that this will not depend altogether on getting rid of superfluous water, but upon the circulation thereof which is effected, and also upon the circulation of air that must be consequent upon all under ground drains formed with potsherds, broken slates, or brush-wood. I even question whether such drains might not, on this account, be of advantage in gardens, in which the soil was dry enough not to require any lodged water to be carried off.

SCIENTIFIC PRINCIPLES OF SEED SOWING.

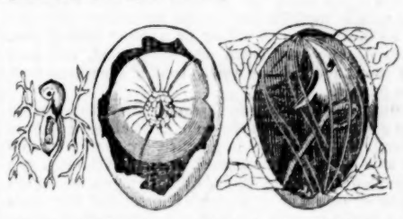
I have already hinted, that the food of young plants, when they first germinate, or begin to *braird*, as it is provincially termed, is very different from that of full grown ones; for, instead of taking up the ordinary food, they depend in a great measure upon the materials stored up in the seed, in much the same way as the chick, before it breaks out from the egg, depends in a great measure upon the food stored up there. I have used the qualifying phrase, "in a great measure," both in the case of the young plant, and of the chick, though it may appear, at first view, to some that the chick enclosed in the shell has no means of obtaining any food not included in this form without,—but two other principles are indispensable; I refer to heat and air.

Heat, if it do not form a portion of the food of the chick, and of the plant, is indispenable, either for exciting and stirring up into activity the vessels which carry the nutrient materials to the parts where they are wanted, or, as all fluidity depends on heat, for rendering the food sufficiently liquid to pass into and along these vessels.

Such is the theory, and it accords with the established facts, that a chick cannot be hatched in a heat less than one hundred and four degrees of Fahrenheit, while seeds require heat from forty to eighty degrees, above or below which they will not germinate well. As we have seen, however, that buds once roused into growth, will go on to grow even when cold recurs, so seeds, after germinating in artificial heat, may have the plants thus produced planted with success in the open air.

[Fig. No. 70.]

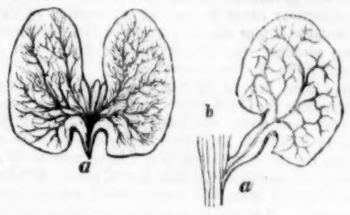
Eggs during the process of hatching, broken open to show the vessels supplying nutriment to the chick, which is shown separate from the egg on the left.



Air is supplied to the chick in the egg through the minute pores, or holes, in the shell, and probably to the seed of the plant in a similar way, though this is a point not well known. It is the oxygen of the air which is the indispenable material, both to the chick and the plant, for when confined in carbonic acid gas, or in azote or hydrogen, they both die. Too much oxygen, however, like too much heat, will excite growth too rapidly, and disease, and at last death, will be the consequence.

[Fig. No. 71.]

The nutrient vessels in the seed lobes of a germinating bean, magnified.



EFFECTS OF WATER AND STEEPING.

So far the chick and the seed have a close resemblance; but water, so indispensable to a grown fowl, would, in the smallest quantity, kill the chick in the egg, while it is equally necessary for the evolution of the plant from the seed, as it is to the full grown plant. Seeds that appear to have germinated without water, must have derived moisture from the air.

The principal effect of the water, when introduced within the shell of the seed, appears to be that of dissolving or, at least rendering more liquid, the portion of it whose use is similar to the contents of a bird's egg. The starch also, which is generally, if not always, in this portion of the seed, is converted into sugar, a process that can be imitated artificially.—Along with this some mucilaginous matters are observed rendering the food of the embryo plant not much unlike, in chemical qualities, to animal milk. The contents of the seed, thus changed into a sort of milky pulp by the addition of water, swell by degrees, and the first point of the future root having formed, breaks through the shell in a downward direction (*a*) and about the same time, the first point of the future stem comes forth in an upward direction (*b*,) as may be seen in the figures.

It will be an obvious inference respecting water, that, like the oxygen and the heat, if it be in too great quantity it will render the contents of the seed too thin, and weak, and will also increase their quantity so much that the vessels of the embryo plant will be gorged, and disease or death will follow. When the quantity of water again is not enough to produce this effect, still it may be in such large proportions as to push the growth too rapidly for the health of the plants, which will in that case be too pale on appearing above ground. Hence the importance is clear, of sowing in dry rather than moist weather.

Hence also the practical error, at least in most instances, of steeping seeds; which is chiefly useful in separating the infertile seeds that may swim on the water. All steeps which contain any thing but water and oxygen gas, are unnatural, and must be injurious; such, for instance, as urine, or drainings of dunghills loaded with humic acid, which embryo plants cannot feed upon, any more than a new born infant could drink strong ale or wine with impunity. Some strong infants might survive taking such drink, as some strong seeds may survive the steeps, but these survivals would not justify the practice. Steeps are recommended with a view to destroy the eggs of insects, but I am not acquainted with any destructive garden insect that lays its eggs upon seeds, and I am quite positive, supposing them to exist, that no steep would kill such eggs which would not at the same time kill or greatly injure the seed.

I am not aware of the effect of light upon the hatching of the eggs of birds, though with respect to the eggs of many insects, light certainly does not prevent them from being fertile. On seeds light acts so powerfully in retarding their germination, that though they have a due degree of heat and a due supply of oxygen and water, they will not grow, at least healthily, unless in the dark. The reason is that light causes the oxygen which is indispensable for their growth, to be carried off, and fixes in them the carbonic acid gas which is yet as improper food for the embryo plant as beef would be to a new born infant; whereas in the dark, the carbonic acid gas escapes into the soil, while the oxygen is taken up into the embryo plant.

Hence the importance of putting seeds deep enough into the soil to exclude the light, taking care at the same time not to put them too deep to be out of the influence of fresh circulating air. From half an inch or less to an inch, is about the average depth for garden seeds.

TIME OF GERMINATING.

Some seeds, such as those of the coffee plant, require to be sown immediately on being gathered, otherwise the nutrient matters contained in the shell become too hard to be dissolved in water. Others, as holly berries, require to be kept for about twelve months to mellow. It is said, and I believe in many instances proved, that seeds, such as those of the balsam, if kept for several years, are more apt to produce plants with double flowers, in consequence, it would

appear of their nutrient matter being more condensed.

The period between sowing and germinating is very different according to species. Mustard, for example, will germinate in one day, or less if stimulated with chlorine; cress in two days; turnips in three days, lettuce in four days; parsley in about six weeks or two months; the peach in one year; and the rose and filbert in two years.

It has been proved by experiment that seeds gathered before they are quite ripe, germinate sooner than very ripe ones, obviously because the nutrient matter is less hard and more easily diluted with water; and on the same principle, I have proved by experiment, that potatoes, when saved green for planting and kept in bran, will come several weeks earlier than others. It would be worth trying the roots of the dahlia and marvel of Peru on the same principle. Though seeds, when gathered before they are quite ripe, germinate sooner, it does not follow that they will produce the best plants.

SCIENTIFIC PRINCIPLES OF TRANSPLANTING.

The removing of growing plants from one part of the garden to another is done for various reasons, and the science of transplanting will consequently depend on the intention of the gardener in the operation. The principal facts to be recollected are, that every plant takes its food by the tips of the root fibres, and that the sap thence carried up into the leaves has much of its water and oxygen carried off by exposure to light, particularly to sunshine. It follows that if part or all of the tips of the root fibres be broken off or bruised, the plant will be kept hungry or starved, just as an animal would be with its mouth much injured or blocked up; while if a plant in such a state is placed in the sunshine, the water and oxygen carried off thereby will very soon cause it to flag, wither, and die.

TRANSPORTING.

If the gardener's object then be simply to move plants from one place to another without affecting their growth in any way, it will be important to preserve every root fibre entire; and even, when this can be done, to take it up with part of the soil in which it has been growing, or with a large ball of earth, as it is termed. When this cannot be done, the root fibres ought to be placed in their new station as nearly as possible in the manner they were at first, and hence dibbling, where the soil is at all stiff, will be bad practice, from its being certain to confine and crush the root fibres within the walls of the dibbled hole.

It is partly upon the principles here laid down, that Sir Henry Steuart, of Allanton, has succeeded in removing the largest trees without heading down the branches, as was wont to be practised.

If it be found impossible to preserve the root fibres from injury, or to replant them exactly as they were, then, in order to diminish the loss of water and oxygen, the plants ought to be shaded from the light, or if that cannot be done, they ought to have a suitable proportion of their leaves or branches cut off. De Candolle says this practice was wont to be so universal on the continent, that the gardener's maxim was, "if you plant your own father, you must cut off his head." Sir Henry Steuart has proved the bad science of such universal barbarity.

Without taking up the soil in an undisturbed state, it is difficult to transport, uninjured, plants having few root fibres and large leaves, such as the poppy, because the few spongelets of the fibres which supply the sap are apt to be obstructed in a new soil even when free from injury.

PRICKING OUT SEEDLINGS.

The object in what is termed pricking out seedlings, is different from simple transportation. In the case of early lettuce, for example, or early annuals, such as balsams and coreopses,* it arises from the necessity of sowing the seed under the influence of artificial heat, in order to get plants of some size sooner than they could be had by sowing in the open air.

The lettuces cannot be improved and are almost certain to be injured by the operation, in consequence of their small number of root fibres (not quite so few as in the poppy) and the largeness of their leaves. Accordingly, lettuces, when pricked out under the most favorable circumstances of moist cloudy weather, always flag more or less, and hence the leaves are apt to be checked in their growth so as to be less juicy, their juiciness depending on the most rapid and unchecked growth that can be effected. Rich soil, however, and plentiful watering, may overcome the check in the growth from pricking out.

In the case of the balsams and the coreopses, the check in growth from pricking out is advantageous, because the leaf pulp becoming much thickened by the great loss of water and oxygen, when it returns to the stem and to the life knot or crown of the root, it lays the basis of fresh branches terminating in flower buds. Whereas were a seedling plant to remain unmoved in a rich soil well watered, it would probably send up more sap than the light could readily deprive of its water and oxygen, and thence would push out new leaves to carry off the superabundance, while there would be no pulp formed thick enough and containing enough of carbon to produce flowers.

It is important not to plant the roots too deep, so as to be out of the reach of air, or too shallow to expose them to drought. By a natural proces an ash will send its roots across a deep ditch, keeping always under the soil about six or ten inches and rising again on the other side. In a dry season, the roots of trees will dip down in search of moisture into a bad under soil.

For the same reason, either kidney or broad beans if taken up and transplanted when only a few inches high, will have their growth checked, and will flower and fruit sooner, though they will not grow so tall, as those which have not been transplanted. It is on the same principles advantageous to transplant brocoli, Brussels sprouts and cauliflower, which will make them head more readily, though care must be taken that the growth is not so much checked as to render the heads small and their stalks tough. Trees are, in their youngest state, frequently transplanted by nurserymen to increase their root fibres.

It may with this view also be advisable, in some instances to trim off some of the root fibres to diminish the supply of sap, and cause new root fibres to grow; a thing which ought never to be done where luxuriance of leaves is an object, and hence the old practice of trimming both the root fibres and the branches or leaves at the same time, is in the most cases highly absurd.

SCIENTIFIC PRINCIPLES OF STRIKING.

By certain experiments, not by any means praiseworthy, yet, beyond all question, correct, it has been proved that, if the head of a snail, or of an earth worm, be cut off, the body will not only live for a considerable time, but a new head will be reproduced, with a mouth capable of taking food. By similar experiments it has been found that the legs of spiders and the feet of frogs, when cut off, are reproduced.

Upon a similar principle, when the roots of certain plants which are to them what the head is to animals, are cut off, new roots may, under peculiar circumstances, be reproduced. The chief condition required for the reproduction of such roots, in the preservation of their life till the roots have time to form, and various expedients are resorted to with this view, as well as for the quick production of the roots.

CHINESE MODE OF STRIKING.

The simplest mode of striking is that practised by the Chinese, and which I have tried successfully with the lilac. Lord Macartney was surprised to find in the Emperor of China's hall of audience a number of dwarf pines, oak, and orange trees bearing fruit, in frames filled with earth, and placed on tables. These are produced by selecting a fruit-bearing bough, with a good branchy head, and taking off from the stem a ring of bark about an inch in length. Around this is placed a ball of rich earth, tied on with bass or coarse cloth, and the whole is kept moist by means of a vessel of water hung over it with a very small hole, or a thread to convey the water drop by drop. The descending pulp being stopped short in its passage downwards towards the root, first forms root buds, which soon send out roots into the moist earth, and when these are deemed strong enough to feed the plant, the branch is cut off a little below, and the tree in minature is ready for planting in a pot.

The process has been varied by having garden pots made so as to enclose the ring branch, and in this way dwarf fruit-trees are often formed on the continent, where they are much prized.

STRIKING BY LAYERS.

The common mode of striking by layers proceeds on the same principle. Some plants may be said to propagate themselves by layers, such as the strawberry, which sends out runners that take root, and the ends of the common bramble sometimes take root in a similar way. A willow or a privet branch also, if accidentally bent down into the ground, will send out roots, and become a new tree, if separated from the parent.

But in most instances, it is requisite so to interrupt the downward flow of the pulp, as to cause it to form root fibres, and hence, in practice, the branch intended as a layer, is slit, tongued, or cut half through in a direction sloping upwards, or it is ringed, as in the Chinese mode, or it is pierced in several directions by a brad-awl, or it is wired or twisted; all of which operations have the same design of checking the descent of the pulp, while the sap going up in the more central parts is not interrupted, and consequently the layered branch grows as well as, if not better than, if it had not been so treated. The soil ought not to be too damp, otherwise the cut part may canker.

Towards the end of the autumn, layered plants are, for the most part, sufficiently furnished with new roots to feed them without farther dependence on the parent plant; but they are in general still weaker than seedlings, and require to be not only watered, but the more tender sorts not exposed to too bright sunshine.

STRIKING BY SLIPS, OR CUTTINGS.

In the preceding modes of striking, the layer, being partly in communication with the parent plant, is in no danger of perishing for want of food; but, in the case of cuttings, the circumstances are much the same as in the experiments alluded to, made upon the snails and earth worms, inasmuch as they are deprived of their natural feeding organs, their root fibres. In the first instance, therefore, a cutting like the headless snail and earth worm, must live entirely on the nutrient materials it already possesses, which are, as we have seen, partly laid up in the cells of the stem, but more particularly in the buds. Hence it becomes important to have a bud, or buds, on every cutting intended to be struck; but leaves, or at least many leaves, are disadvantageous, as tending to exhaust life, by giving off too much water and oxygen. In the case of evergreens, however, in which the action of the leaves is so slow as not to produce exhaustion, they must be left on, to assist in maturing the pulp for the new roots, but no such leaves must remain below the surface of the soil, lest canker ensue.

The end of a cutting, to be planted in the soil, ought to contain a heel of older wood than the bole, or stem, and be cut very smooth, in order to prevent water from stagnating in any crevice or bruise, and thus tending to rot the part. The heel of older wood is to prevent too much water being taken up by the more active and more open vessels of the bole, which would render the whole dropsical and sickly.

For the same reason, rich earth, very retentive of water, is bad for most cuttings; and species difficult to strike require to be planted either in pure sand, or in a soil containing a large proportion of sand to drain off all superfluous water which ought to be supplied in small quantities, but frequently, so as to keep it in constant circulation. Hence, orange-trees can only be struck by a drain of broken potsherds in the bottom of the striking pots. This is one of the true scientific principles of striking cuttings.

Another is founded on the effects of light upon leaves, or buds, which being furnished with only a scanty supply of food, cannot stand much loss of water and oxygen; and hence they are covered with a bell glass, both to modify the intensity of the light, (some light is indispensable,) and to render the included air moist, from the water given off in the form of vapor. Some fresh air, however, is as necessary as some light, in order to produce a healthy leaf pulp, and hence, the bell glasses must not be kept air tight.

When bell glasses are not used, it is found that cuttings succeed best in a border with a northern aspect, protected from the wind; or, if otherwise situated, they require to be screened from the force of the noonday sun.

The same principles of supplying regularly a moderate portion of water, so as not to cause dropsy by overgorging, and of sheltering from too much dry air, and bright sunshine, so as not to cause exhaustion, regulates the striking of buds, or *eyes*, as they are termed, which always require a leaf attached, and even of leaves themselves, such as those of the cacti.

SCIENTIFIC PRINCIPLES OF GRAFTING.

When the finger is cut with a knife, the blood vessels soon after contract their cut extremities into an opening so narrow, that the thicker and red-coloured part of the blood cannot pass, and the bleeding therefore ceases. But even then there oozes out the thinner watery part of the blood, consisting chiefly of matter the same or similar to the white of an egg, which being thus separated from the rest of the blood, thickens by the heat of the body, as the white of an egg does by boiling. If the lips of the finger-cut accordingly be kept close together by sticking-plaster, they will become united by means of this natural glue, as it may be termed, in little more than a day. Upon the same principle, when I was a student of medicine, I once succeeded, as others have done, in managing to unite the whole tip-joint of a finger which a boy had chopped off by machinery; and experiments have been successful in causing the spur of a cock to unite and to grow upon his comb.

It is upon similar principles that the science of grafting is founded; for if a young branch, like the boy's finger, be chopped off by a clean cut, and the cut extremities immediately joined, the decending pulp will thicken like the watery part of the blood, and while it remains soft, the sap from the cut ends of the sap vessels will force its way through to their continuation above in the cut slip, which, if the process be successfully managed, will grow as well, or nearly, as if had never been cut.

If, again instead of applying the same cut slip to the part it was cut from, a slip from another tree be applied, as if I had applied to the boy's finger the tip of another boy's, chopped off by the same accident, there seems no good reason to doubt that a similar

* It is correct to say "one Coreopsis" and "two Coreopses."

healthy joining might, by care, be effected. In the case of animals, indeed, such joinings are rare, because rarely tried; but in garden plants they are exceedingly common; for the purpose of continuing esteemed varieties of fruits and flowers, accidentally produced by cultivation, as well as for forwarding the fruiting of young trees—since seedlings require years to arrive at a bearing state.

On examining the joining of a graft about a fortnight after it has been made, I have found, as in a healing finger-cut, a number of small roundish grains, in form of a thin layer, produced from the thickening of the pulp, and destined to form the hard substance which in general projects a little externally, and the scar differs in appearance from the other parts of the bark. It is, however, only in the space between the pulp-wood and the bark that the uniting substance is formed, and therefore it is evident the slip to be grafted must have this part applied to the same part of the stock, and, if these differ in thickness, at least on one side.

BINDING OF THE GRAFT.

When the joining has been made by cutting and properly fitting the bark of the slip to the bark of the stock at least on one side thereof, it must be bound so as to prevent this junction from being deranged. This is usually done with a ball of three parts of clay free from stones, well worked with one part of fresh horse-droppings and a little finely chopped straw, the whole about an inch thick, and two inches or more in length, being tied with a ribband of bass.

The principle upon which this is done, is to prevent the oxygen of the atmosphere from getting to the fluid pulp at the joining, where it would unite with the carbon and form carbonic acid gas, and thereby rob the pulp of its solidity. The exclusion of light is necessary on the same account, for, as in the case of a finger-cut, the oxygen would unite with the carbon and prevent the thickening of the matter from the blood. On the same account, moisture, by supplying oxygen, would be injurious; and dryness might act both by exhausting the pulp and by causing the edges of the bark to shrivel and gape, which would facilitate the entrance of the air with its oxygen.

It must be obvious from this simple principle, (never, that I am aware of, before stated with reference to grafting,) that no composition, whatever may be said of its peculiar power of healing, can act in any other way than this; any more than the farrago of plasters and salves for healing flesh wounds and cuts, which are only good in so far as they keep the lips of the wound together, and exclude oxygen and light.

[The following communication was received after our paper for February, was at press. We therefore give it in our supplement, and we do it with pleasure, as the readiest means of correcting the mistatement which it imputes to our correspondent.—*Cond. Cult.*]

Hon. JESSE BUEL—Dear Sir—The undersigned members of the executive committee of the American Society for the Diffusion of Useful Knowledge, beg leave to state to the readers of the Cultivator, that the charges by an anonymous correspondent, in the January number of that paper, against the society, and those charged with the management of its affairs, must have arisen from a want of knowledge of the operations of the institution, and are without any foundation whatever.

The committee will make a more particular reply in the March number of the Cultivator. The number of gentlemen acting on the committee, and the intervals of their meetings, make it impracticable to forward an answer in season for the next number.

Passed in Committee, January 18, 1839.

Cha's Sam'l Stewart,	James Brown,
Geo. F. Allen,	Thomas Cock.
John T. Gilchrist.	A. P. Halsey.
Cornelius Baker.	J. Proudfit.
John Torrey.	John A. Vaughan.
Gorham D. Abbott.	

[The following, like the preceding communication, came too late for its proper place in the Cultivator. We give it without comment—leaving the reader to form his own conclusions of the matters in controversy, and to impute blame, if any is called for, wherever he may think it ought to attach. We only say, we believe we have much yet to learn, in regard to the relative merits of the different species and varieties of the mulberry.—*Cond. Cult.*

J. BUEL Esq.—In the January number of the Cultivator, is a long article purporting to be editorial, containing reflections upon Samuel Whitmarsh and D. Stebbins, saying however: "We do not mean to charge these gentlemen with wanton deception, for we have a high opinion of their standing, yet there is something so contrary to received opinions, that we cannot pass them as current truths, without asking for some explanation:" and demurring at the assertion of Mr. W. "that the Alpine is the kind universally used in France and Italy," and for authority to the contrary, the declarations of Gen. Tallmadge, and others are offered to show, that the black and white mulberry are most used. But by late intelligence, however, from Europe, the Alpine mulberry is recognized, as well as the morus multicaulis, for American market. Yet it is not of a fig's consequence to us, what kinds of mulberry are known or used in Europe, provided we have the same, or others, congenial to our climate, and producing the best of foliage in equal abundance and quality for growing silk.

Mr. W. was sent out by the Northampton Silk Company, (as understood) to visit the most noted silk districts, to inform himself as fully as practicable, on the whole subject of growing and manufacturing silk, which of course would involve inquiry for the best kind of mulberry for our use.

In the next place, the motives of Dr. Stebbins are called in question, for advertising the *Manilla multicaulis*, the *Canton*, the *Alpine*, the *Asiatic*, the Smyrna, the Brussa, Dandolo and others; about which, the editor says: "Now we protest against the fabrication of new names for old things—whether it be from ignorance—for novelty, or to subserve the interest of the trade"—rather crude suggestions however. Although it has been sometimes said, that we are to judge others by ourselves. He considers the *Alpine, Asiatic and Smyrna*, to be absolutely of new coinage, "that this unnecessary multiplication of names, tends to mystify the business—to deceive the public, and retard a useful branch of national industry, and believes that *all* named in the Doctor's advertisement, are merely varieties of the white mulberry, &c."

Thus, the editor substantially confirms, what is stated in the advertisement about the morus multicaulis, Brussa and Dandolo mulberry. And here it may be observed, that by no fair construction of language, does it any where appear that there is any "*insinuation*" made, that among the trees named, or alluded to in the advertisement, that any of them are "unfit for the entire subsistence of the silk-worm, and the production of excellent silk." The suggestion appears wholly gratuitous on the part of the editor.

I am sorry that the words, "neither *ingenuous* or *true*," have been so applied by him, nor can see any particular necessity or use of the following sentence, unless it be for the purpose of personal abuse: "We have no objection that Doctor S. should puff his own wares, or his own kind of trees.—but we do object to his doing it to the prejudice of others and of truth." This same sentence of the judge, without trial by jury, appears to be rather arbitary, for only saying: "the Brussa and Dandolo *appear* to be selected white mulberry"—while the judge may say with impunity, and without being charged of "doing it to the prejudice of others and of truth"—for he asserts that he "believes that *all* which are named in the advertisement, are merely varieties of the white mulberry."

Others have advertised more kinds of mulberries than was contained in the advertisement, and never a complaint.

Nurserymen advertise a great variety of apples, peaches, plums, pears, &c. One list enumerates 317 different kind of pears—228 of apples—154 of peaches—66 of plums—68 of cherries—all of excellent quality, and probably if asked the reason—would say, to *distinguish one from the other*, called good, better and best, and each bearing a different name.

Doctor S. had the pleasure of eating some delicious fruit, from the garden of the judge, which were called by different names, "although of the same family," and had no idea of accusing him of "the fabrication of new names for old things," or that the names were of "new coinage."

If the advertisement had been published with the criticisms, the public would have seen that the *Manilla multicaulis*, the *Canton* and *Alpine*, were so called, to designate the places of origin—the same also might be said of the others.

And now disclaiming any pretence of puffing my own trees to the prejudice of others and of truth, I would venture to ask, if it might not be gratifying to many of your readers, to see the advertisement published? and let them judge of its mystification: I have the pleasure to state, that all the names given in the advertisement, have been, and are, recognized by numerous orders from the empire state—from the remote south and west—from the east and north—where the *Canton*, Asiatic and Alpine, in particular, have become favorites, for cultivation and for making silk. No fear therefore, need be entertained by either of us, that the public will be deceived, or a useful branch of national industry retarded. Such, however, is the opinion of your respondent, with sentiments of due respect.

DANIEL STEBBINS.

Northampton, January 21, 1839.

Young Men's Department.

Chemical Catechism—Chapter VII.

[*From Parkes's Chemical Catechism.*]

OF ACIDS.

*What is an acid?**

Most of the acids are substances which produce that sensation on the tongue which we call *sour*; but some substances are classed with the acids which have not this characteristic—though they possess some of the other properties of acids.

What are the properties of acids?

Acids change the blue, green, and purple juices of vegetables to red; and combine with alkalies, earths, or metallic oxides, so as to form those compounds called *salts*.

What is the origin of acids?

Most of the acids owe their origin to the combination of certain substances with oxygen,† which has been called the acidifying principle.

How is it known that oxygen imparts acidity?

This is built upon analogy; for it is found that most of the acids contain oxygen, and that they lose their acidity exactly in proportion to the quantity of oxygen which is taken from them.‡

Are there any other means of ascertaining this?

Yes: some acids may be decomposed, and deprived of their oxygen, and others may be formed by a direct combination of oxygen with certain radicals.

Do the same radicals always combine with an equal portion of oxygen?

No: some of these acidifiable radicals combine with different proportions of oxygen, and consequently produce different states of acidity.§

How is this difference distinguished?

When two acids have the same radical, but contain different quantities of oxygen, they are distinguished by their termination. The name of that which contains most oxygen ends in IC, the others in OUS.—Thus we say *sulphuric* acid, and *sulphurous* acid; *phosphoric* acid, *phosphorous* acid.

What substances are capable of being acidified by oxygen?

The mineral, the vegetable, and the animal kingdoms, all furnish bases or radicals, which become acid by their union with oxygen.‖

Do all the acids owe their acidity to the presence of oxygen?

The greater number of the acids are evidently indebted to oxygen for their acidity, but there are substances that possess acid properties which contain no oxygen. Until lately, there were also three acids whose composition was unknown.

How are the acids classed by chemists?

The acids were formerly divided into three classes, viz. the mineral, the vegetable, and the animal acids; but the more useful and scientific way of dividing the acids is into two classes only.

How are the acids now divided?¶

The undecomposable acid, and those which are formed with two principles, are comprised in the first class; while those acids which are formed with more than two principles compose the second class.

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* The acids differ from each other in their appearance and properties as much as any class of bodies we are acquainted with: it is therefore difficult to give a definition of an acid.—In general they are liquids, but some of them take a solid, and others a gaseous form: some are mild, others corrosive; some are pungent and volatile, others are fixed and inodorous.

† The substances which are combined with oxygen to form acids are (in all the decomposable acids) *combustible* substances. Indeed several of the acids are the *product* of combustion:—witness the sulphuric, the phosphoric, &c. Five of the metals, and the other simple combustibles, hydrogen not excepted, are all convertible into acids.

‡ Many of the acids may be decomposed, and deprived of their oxygen, by combustible bodies. Any combustible body, that has a greater affinity for oxygen than oxygen has for the radical of the acid, will decompose that acid. Charcoal, when made red hot, will in this way decompose sulphuric acid.

§ The first portion of oxygen converts some bodies into oxides, as is the case with carbon, forming carbonic oxide; and sulphur, forming oxide of sulphur: the second into that class of acids of which the specific names drawn from their particular bases terminate in *ous*, as the sulphurous acid: the third degree of oxygenizement changes some of these into that division of acids which are distinguished by the termination in *ic*, as the sulphuric acid, &c. In like manner we have oxide of phosphorous, phosphorous acid and phosphoric acid.

‖ The mineral acids are generally formed with a peculiar base and oxygen; the vegetable acids, with carbon, hydrogen, and oxygen; while the animal acids are composed of the same substances united with nitrogen.

Some of the mineral acids are decomposable, as already mentioned, by charcoal heated to redness. Some of the vegetable acids are also decomposed, and reduced into water and carbonic acid, by leaving them in an exposed situation to the action of their own principles: others may be changed into different acids, by imparting or abstracting a portion of oxygen.

¶ Those acids of the first class, which are formed with two principles only, are composed of oxygen and some other substances which is called their radical. The acids of the second class are composed chiefly of oxygen, hydrogen, and carbon; though some of them contain a portion of nitrogen, as mentioned in a former note.

Can you enumerate the acids of the first class?

The sulphuric and sulphurous acids; the muriatic and oxygenized muriatic acids; the nitric, the carbonic, the phosphoric and phosphorous, the fluoric, the boracic, the arsenic and ersenous, the tungstic, the molybdic and molybdous, the telluric and the chromic acids.

Enumerate the acids of the second class?

The acetic, the oxalic, the tartaric, the citric, the malic, the lactic, the gallic, the mucous, the benzoic, the succinic, the camphoric, the suberic, the laccic, the prussic, the sebacic, the uric, the amniotic, and the fluoboric acids.

What is the SULPHURIC *acid?*

The sulphuric acid is a combination of sulphur and oxygen. It is commonly called oil of vitriol.

How is the sulphuric acid obtained?

Sulphuric acid is procured by burning sulphur, in contact with oxygen; by which process the sulphur combines with the oxygen, and becomes acidified.

If sulphuric acid is nothing more than sulphur and oxygen, what is it that occasions its fluidity?

Sulphuric acid, at the instant of its formation, is in a gaseous state; therefore the manufacturers find it necessary to condense the gas by means of water.—Hence the sulphuric aid of commerce is always in a fluid state.

What are the properties of sulphuric acid?*

The sulphuric is a very ponderous, corrosive acid, destitute of colour and smell, and has a very strong acid taste. It has a great attraction for water,† and, when combined with the alkalies, the earths, or the metallic oxides, forms with them those salts called *sulphates*.

What is the SULPHUROUS *acid?*

The sulphurous acid, like the sulphuric, is a combination of sulphur and oxygen, but with less oxygen, or, we may say with more sulphur, than the latter.

What are the properties of sulphurous acid?

Sulphurous acid, in the gaseous state, is invisible, like air, but of a strong suffocating smell.‡ It is readily absorbed by water, and then forms liquid sulphurous acid. It is capable of uniting with various bases, and forms the salts called *sulphites*.

What is the MURIATIC *acid?*

The muriatic is a peculiar acid obtained from sea-salt. Until lately, the radical, or base of this acid, was entirely unknown.

What method is made use of to collect and preserve the muriatic acid?

Muriatic acid is distilled from sea-salt by means of sulphuric acid, and collected in appropriate receivers, where it is condensed in water, for which it has a very powerful affinity.

What are the properties of muriatic acid?

This acid, in the gaseous state, is invisible, like air; and has a pungent suffocating smell. With water it forms the liquid muriatic acid, which preserves the smell of the gas, and gives out white fumes when exposed to the atmosphere. This acid is much employed in the arts, and in chemical laboratories.—With various bases it forms the salts called *muriates*.

What is the OXYMURIATIC *acid?*

It is now a prevailing opinion, that the oxymuriatic acid, or chlorine, as it is usually called, is a simple substance. It is known in the gaseous state, and in combination with water: but in the latter form it is more commonly used in the arts.

What are the properties of oxymuriatic acid?

The oxymuriatic acid gas is so suffocating, that it cannot be breathed without great injury; yet it will support combustion. This gas discharges vegetable colours; it burns all the metals,§ and is the only acid that will dissolve gold and platina:‖ with various alkaline and earthy basis it forms salts called hyperoxymuriates.

What other compounds may be formed by means of chlorine, or oxymuriatic acid?

Chlorine will combine with oxygen, with hydrogen, and with nitrogen; also with carburetted hydrogen, and with the carbonic oxide; some of which combinations possess very curious properties as may be seen by reference to the notes.

Those you have now mentioned are all gaseous substances: does chlorine form any other combinations?

By peculiar management chlorine may likewise be combined with sulphur, with phosphorous, and with the metals, including also the metals of the earths and alkalies.

What effect has chlorine upon charcoal?

Chlorine has no action whatever upon charcoal, even though the charcoal be intensely hot when plunged into it. Some intelligent chemists consider this fact to be a decisive proof that chlorine contains no oxygen.

What is NITRIC *acid?*

Nitric acid is one of the constituent parts of nitre or saltpetre. It is a compound of oxygen and nitrogen, in the proportion of about 26 parts by weight of nitrogen, to 74 of oxygen.*

How is nitric acid obtained?

Nitric acid is obtained by distilling two parts of nitre and one part of sulphuric acid in a glass retort, and collecting the fluid in proper receivers.† This acid, which at first contains nitrous gas, and is thereby made of a deep red colour, is in a great measure deprived of it, and rendered transparent and colourless, by the application of heat in a subsequent process.

What are the properties of nitric acid?

Pure nitric acid is clear and colourless, like water; its smell is pungent, its taste exceedingly acid, and its action on animal substances very corrosive. It has the property of permanently staining the skin yellow. It has a great affinity for water; is capable of oxidizing most of the metals, and with various bases forms the salts called *nitrates*.

What constitutes the acid of commerce, called NITROUS *acid?*

Nitrous acid, improperly so called, is in fact nitric acid impregnanted with variable portions of nitrous acid gas.

What are the properties of nitrous acid?

Nitrous acid is somewhat similar to *nitric* acid in its properties; but its colour varies according to the proportions of nitrous acid gas which it has absorbed, and the water that it contains.‡

What is CARBONIC *acid?*

Carbonic acid is a combination of carbon and oxygen. It was formerly called fixed air, on account of its being so intimately combined in chalk, limestone,§ magnesia, &c.

What are the properties of carbonic acid?

Carbonic acid is invisible when in the state of gas, and unfit for combustion, or respiration. Water, by pressure may be made to absorb three times its bulk of this gas; by which it acquires an agreeable acidulous taste. Carbonic acid in the proportion in which it exists in atmospheric air is favourable to the growth of vegetables, but in a large proportion is highly injurious. This acid enters into combination with the alkalies, with earths, and metallic oxides; and forms with them those salts called *carbonates*.

What is PHOSPHORIC *acid?*

Phosphoric acid is a compound of oxygen and a peculiar substance called phosphorus.

How is phosphoric acid procured?

Formerly phosphoric acid was procured only by burning phosphorus in oxygen gas; but, since it is known that this acid is a component part of animal bones,‖ we now procure it at a much cheaper rate from that source.

What are the properties of phosphoric acid?

Phosphoric acid is very soluble in water: the solution is colourless; it has a strong acid taste:* by evaporation the solution becomes very dense and of an oily consistence. This acid may by evaporated to dryness, and even submitted to a white heat, without suffering any change, or being volatilized. It forms by its union with earthy, alkaline, and metallic bases, that variety of salts which we call *phosphates*, and occurs in nature combined with lime, oxide of lead, and other bases.

What is the PHOSPHOROUS *acid?*

This acid contains a smaller proportion of oxygen than the phosphoric acid. It is procured by the *slow* combustion of phosphorus; for when phosphorus is heated it burns *rapidly*, and the product is phosphoric acid.

What are the properties of phosphorous acid?

Phosphorous acid is a dense, viscid liquid, with an acid taste, and emits the smell of garlic when heated. This, like the phosphoric acid, may be decomposed by charcoal, but cannot be obtained in a concrete state. It has not yet been applied to any use. The salts formed with it are called *phosphites*.

What is FLUORIC *acid?*

The fluoric is an acid of a very peculiar nature, found in the fluor spar,† which is a natural production, composed of fluoric acid and lime. This acid is found also nearly in the same proportion in the *cryolite*, a rare mineral brought from West Greenland. The topaz likewise contains fluoric acid, though in a less proportion.

What are the properties of fluoric acid?

In the state of gas it is invisible like air. Water rapidly absorbs it, and forms liquid fluoric acid. It has an acid taste, and the peculiar property of corroding silica. With the alkalies and earths it forms salts called *fluates*. Though it has been decomposed, the nature of its radical is not yet known.

What is the use of fluoric acid?

Fluoric acid has been used for etching upon glass; also in various cases for destroying the polish upon glass, so as to render it nearly opake. It appears that it was employed for the first named purpose so early as in the seventeenth century.

What is the ACETIC *acid?*

Acetic acid is principally obtained from saccharine liquors which have undergone the vinous formentation.

What are the properties of acetic acid?

Acetic acid, as it is usually prepared, is a pleasant yellow liquor, well known. When distilled it is as colourless as water, and of an agreeable odour. In both states it is known in commerce by the name of vinegar.

How is the concentrated acetic acid, or radical vinegar as it is sometimes called prepared?

Concentrated *acetic* acid is obtained from acetate of copper, acetate of soda, or acetate of potash, by decomposing either of them by means of sulphuric acid, and then distilling the product.

What are the properties of acetic acid in this state of concentration?

Acetic acid thus prepared is very pungent, acrid

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* When sulphur is combined with a smaller portion of oxygen, it forms a volatile acid of a penetrating smell called *sulphurous* acid; a larger portion of oxygen gives what we call *sulphuric* acid, which on the contrary is very ponderous, and destitute of smell. These acids are constituted in the following manner:—*Sulphurous* acid consists of 100 parts of sulphur and 100 of oxygen; while *sulphuric* acid is composed of 100 parts of sulphur and 150 parts of oxygen.

† Sulphuric acid and water combine so intimately that the compound gives out a large portion of caloric. Four pounds of this acid mixed with one pound of water will raise the thermometer to 300° of Fahrenheit.

‡ Sulphurous acid gas is used by manufacturers in bleaching straw and silk. A slow combustion sulphur is promoted in a close chamber, and the goods are exposed to the gas as it is produced. Thus, silks, which are dyed by archil of a dark lilac, are brought to a beautiful flesh-colour by the fumes of this gas. Flesh-coloured silk stockings are also colored in this way.

§ Metals beaten into thin leaves, or reduced to powder, inflame when thrown into a vessel filled with this gas, provided the temperature be not lower than about 70°, and present a kind of shower of fire.

‖ Mr. Humbolt has found that seeds which do not commonly germinate in our climates, or in our hothouses, and which, of course, we cannot raise for our gardens or hope to naturalize in our fields, become capable of germinating when immersed, for some days, in weak solution of oxymuriatic acid. This interesting discovery has been turned to advantage in some botanic gardens.

* It is curious that the gases which compose atmospherein air, so necessary to our existence, should, in different proportions, produce also one of the most corrosive acids.

21 parts by weight of oxygen, mixed with 79 parts of nitrogen } form atmospheric air

100

74 parts of oxygen, with 26 parts of nitrogen, } when chemically combined and condensed by water, form nitric acid, or aquafortis.

100

Surely none but Deity could have conceived an idea of the production of such *different* susbtances from the *same* principles!

† The manufactories of this acid are commonly called AQUAFORTIS WORKS. The acid is drawn of different strengths, according to the purposes for which it is designed. It is used in dying, in refining gold, in medicine, and in a great variety of manufactories.

‡ The changes which take place on the addition of water to strong nitrous acid exhibit very curious phenomena. Different portions change its colour to a blue, a geeen, a yellow, &c. while the vapours which rise from it preserve their original flame coloured red.

§ Carbonic acid is composed of about 28 parts carbon and 72 oxygen.

‖ When animal bones are divested of their oil and jelly, the earth which remains is chiefly lime, united with phosphoric acid, and this phosphate of lime is often employed for the preparation of the medicinal salt called phosphate of soda. But Mons. Chaptal jun. son of the Count Chaptal, employs bones in Paris, as I am informed, in a very different manner. Having a large establishment for the preparation of soda, in which process a larger quantity of muriatic acid is afforded than can be consumed in the ordinary way, he employs persons to collect bones from all parts of the city, and digests them in this spare muriatic acid. The acid dissolves the phosphate of lime and leaves the gelatine. The latter is made into soup, and sold in every district in Paris.

It is worthy of notice, that phosphate of lime is found in abundance also in milk. This seems to indicate, as Fourcroy beautifully remarks, "that Nature thought fit to place in the first nourishment of animals a quantity of osseous matter, with a view to the necessary celerity of the formation and growth of the bones in the earliest stage of their lives."—This fact is probably unknown to some who study natural history, and is one of the numerous instances of the beneficence of the Creator, exemplified by the science of chemistry. The more we know of the minutiæ of matter, and of the laws by which it is governed, the greater occasion shall we have to admire the excellence of contrivance and the benevolence of intention of the Omnipotent Artificer. Let the advocates for chance consider the aforesaid fact, and say, if they can, that phosphate of lime is found in animal milk, in consequence of *fatality*, and that it occurs by *accident* where it performs so important an office in the animal economy. It is also a remarkable fact, that the nearer the female approaches to the period of parturition the more is the milk charged with this calcareous phosphate, and that it is not till the digestive organs of the infant are sufficiently strengthened to answer the purposes and the work of animalization, that this earthy salt disappears from the milk of the mother.

* Pure phosphoric acid obtained, without the addition of water, by burning phosphorus in oxygen gas, has the form of white, snowy, light flocks, of a very strong acid taste. By exposure to the air it attracts humidity, and becomes a *fluid* acid. One hundred parts of dry phosphoric acid consist of about 46½ phosphorus and 53½ oxygen.

† Fluor spar is found in many parts of Europe, particularly in Derbyshire. It is employed in the manufacture of ornamental vases, &c. It is constituted of about 67 per cent. of lime and 33 of fluoric acid.

and volatile, and corrodes animal substances. With various bases it forms the salts called *acetates*.

What is OXALIC *acid?*

The oxalic is a peculiar acid found in the juice of sorrel, in combination with potash. Several substances also, and particularly sugar, contain the bases of this acid in a convenient form for conversion into oxalic acid by combining it with oxygen; and hence it has also been called the acid of sugar. It crystallizes in four-sided prisms, has a very acid taste, and is soluble in water. It is composed of oxygen, hydrogen, and carbon.

What are the uses of oxalic acid?

Oxalic acid is of service in detaching the presence of lime in solution. It is also become an article of great consumption with the calico-printers, both in the state of crystallized oxalic acid, and in that of superoxalate of potash. In combination with earths, alkalies, and metallic oxides, it forms the salts called *oxalates*.

What is TARTARIC *acid?*

Tartaric acid is a particular acid found in the tartar of commerce.* It is capable of crystallization, and easily soluble in water. It is used by calico-printers to discharge false prints. The salts formed with it are called *tartrates*.

What is CITRIC *acid?*

Citric acid is found in the juice of lemons and several other fruits. It crystallizes in beautiful rhomboidal prisms, is extremely acid to the taste, and very soluble in water. It is used in various ways for domestic purposes, for medicine,† and in the arts. The salts formed with it are called *citrates*.

What is MALIC *acid?*

Malic acid is obtained from the juice of apples, in which it exists ready formed.‡ It is a very acid, reddish-coloured liquid, composed, like the other vegetable acids, of oxygen, hydrogen, and carbon. It is incapable of crystallization, and has not yet been brought into any use except as a chemical test. Its salts are called *malates*.

What is LACTIC *acid?*

Lactic acid is prepared by a peculiar process from milk after the curd has been separated. It is an acid of a yellow colour, incapable of crystallization, and has not hitherto come into use. The salts formed with it are called *lactates*. The earthy and alkaline lactates are all deliquescent salts.

What is GALLIC *acid?*

Gallic acid is found in the galls of commerce, and in most astringent vegetable substances. It is obtained in thin transparent plates, and in minute needle-shaped crystals, of an acid austere taste. It has the property of precipitating iron, from its solution in acids, of a black colour. Its salts are called *gallates*.

What is PRUSSIC *acid?*

The prussic is a peculiar acid, composed of hydrogen, nitrogen, and carbon. It is a colourless liquid, like water, has a sweet taste and does not alter the colour of vegetable blues. It is of great use to chemists for detecting metals in solution. It is prepared from blood and other animal substances; and when united with iron, forms that beautiful colouring substance called prussian blue.

What is URIC *acid?*

The uric or lithic acid is found in human urine.—Some of the human calculi are composed entirely of this acid. When pure it has neither taste nor smell, but it reddens vegetable blues, and combines with alkalies and earth. It is a composition of carbon, nitrogen, hydrogen, and oxygen.

How many different distinct acids are there?

The number of the acids that are well known amounts to about thirty; besides which, a variety of substances have been announced, as new acids, by some of the foreign chemists, that require to be further examined before they be finally admitted into this class of bodies.

What are the USES *of these various acids?*

The uses§ of the acids are so many and important, that it is impossible to enumerate them. They are indispensable to various arts* and manufacturers;† they are employed for culinary purposes,‡ and for medicine;§ they act an important part in the great elaboratory of nature,—they produce that numerous class of bodies called salts, and form a great proportion of many of the rocky and mountainous districts of the globe we inhabit.

Do you recollect any instances of acids entering into the composition of rocks and mountains?

The vast masses of limestone, chalk, and marble, which are found in every part of the world, are combinations of lime and carbonic acid:‖ the mountains of gypsum in the vicinity of Paris and elsewhere are combinations of lime and the sulphuric acid.¶ The fluor spar of Derbyshire is composed of lime and the fluoric acid;** and there are masses of common salt, both in the eastern and western hemisphere, which contain such immense quantities of muriatic acid†† as would render every attempt to calculate the amount abortive.

Are you sure that the acids which Nature has employed in the formation of mountains, are of the same kind as those which come under our common notice and observation?

Yes: any of these native mineral substances may be decomposed, and their acids exhibited in a separate state for experiment or use ‡‡

Do you know of any other natural productions which contain considerable quantities of any of the acids you have described?

The large masses of celestine§§ and of ponderous spar‖‖ in different parts of the earth contain an incalculable quantity of the sulphuric acid; the cryolite¶¶ of Greenland is a compound of alumina, soda, and the fluoric acid; and several of the valuable minerals, together with some of the precious stones, are combinations of the different earths with the chromic or the phosphoric acids; not to mention the annual changes which the vegetable kingdom undergoes by the formation and subsequent decomposition of the vegetable acids.

You speak of the formation of acids:—Are bodies of this class formed and decomposed by the common operations of nature?

Many of these bodies are the result of, and formed by the action of vegetable life, such as the malic and citric acids; some are formed principally by chemical changes effected on dead vegetable matter, as for instance the acetic; and others, as the sulphuric, occur in the mineral kingdom, and are also formed artificially, in great abundance.

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* Tartar is procured from vessels in which wine has been kept. The tartaric acid appears to be a necessary substance in all wine; for it seems from some late experiments that *must* will not ferment if all the tartaric acid be taken from it.

All the vegetable acids seem to be formed from the same radicals, viz: carbon and hydrogen, and perhaps in some there is also nitrogen: the different proportions of these, as well as of the oxygen, constitute the whole varieties.

† Within these few years an important use has been made of this acid in medicine. It is said that the largest dose of opium may be checked in its narcotic effects, if a proper quantity of citric acid be taken with it; and that with this adjunct it induces cheerfulness instead of stupefaction, succeeded by gentle and refreshing sleep. Dr. Willich's *Lecture on Diet and Regimen*, page 339.

‡ The malic acid is found not only in apples, but in strawberries and other summer fruits.

§ The acids are such powerful agents in a variety of chemical changes which take place in nature and in the arts, that it is of the utmost importance to acquire a knowledge of the modes in which they operate. Let it be recollected, then, that there are two ways in which the acids produce changes in the substances with which they are brought into contact. In some cases they effect a union with these substances, and become a part of the new compound, without having themselves undergone any decomposition. In others they become partially decomposed, by affording a part of their oxygen to the bodies on which they operate. The formation of saltpetre or nitre by the addition of nitric acid to potash is an instance of the first of these cases, and the action of the same acid on iron will exemplify the latter.

* Sulphuric acid, in a diluted state, is used by the tanner in the operation called scouring; also by the dyer in a concentrated state, for dissolving indigo. It is likewise employed by hatters. Silk-dyers use it for whitening silks, and for giving them a beautiful lustre. The chemist employs it in the preparation of nitrous and muriatic acid, and as an agent in a variety of processes and decompositions. An account of a great variety of other purposes to which sulphuric acid is applied in the arts may be seen in my *Chemical Essays*, vol. ii. page 469.

Nitric acid is used by dyers to make their solutions of tin. Silver-refiners employ it in the operation of *parting*. It is also used by gilders, brass-founders, calico-printers, colour-makers, &c.

Muriatic acid is employed in dying, calico-printing, and colour-making. The oxymuriatic acid, in bleaching, and sometimes in medicine.

† The acetic, oxalic, tartaric, citric, gallic, and prussic acids are all of them employed in the different manufactures of the country.

‡ The acetic, the tartaric, and the citric acids are used for culinary purposes. According to some experiments of Dr. Macbride, it appears that all the mineral acids in a diluted state might be employed with great advantage in preserving meat.

§ Parliament voted a reward of £5000 to Dr. Carmichael Smyth, for his discovery, that nitrous acid, applied in a state of vapour, effectually destroys contagion, especially typhus, jail, yellow, and such like fevers. See Dr. Smyth, on *The Effect of Nitrous Vapour*, 8vo. 1799.

‖ Limestone, chalk, and marble, are composed of about 44 parts carbonic acid, and 56 parts lime.

¶ Gypsum is composed of 41½ parts of lime, and 58½ of dry sulphuric acid.

** Dr. Thomson analyzed a specimen of fluor spar from Northumberland, and found it to consist of lime 67.34, and fluoric acid 32.66.

†† Common salt, when in a state of purity, is composed of 53½ parts soda and 46½ of dry muriatic acid; but the salt of commerce is always impure.

‡‡ If the pupil be directed to pour a little diluted sulphuric acid upon some pieces of marble, the carbonic acid will be disengaged, and become evident to the senses. In like manner, he may disengage the fluoric acid from the fluor spar, the muriatic acid from rock-salt, and other acids from those minerals in which they are found native. A few experiments of this kind will serve to show him how abundantly the mineral acids occur in nature.

§§ Celestine, which occurs in such large quantities in the neighborhood of Bristol, is composed of about 57 per cent. of strontites, and 43 per cent. of sulphuric acid.

‖‖ Ponderous spar, which is found plentifully in Staffordshire, Derbyshire, &c. and there called *cawk*, is a compound of 67 per cent. of barytes, and 33 of sulphuric acid. The granular kind consists of 90 per cent. of sulphate of barytes and 10 of silica.

¶¶ The *cryolite*, which is a very rare mineral, found only in a dreary and remote region of West Greenland, is, according to Vauquelin, composed of 21 per cent. of alumina, 32 of soda, and 47 of fluoric acid.

Objects, Advantages and Pleasures of Science.

[*From the American Library of Useful Knowledge*]

* * * Reflect how many parts of the reading, even of persons ignorant of all sciences, refer to matters wholly unconnected with any interest or advantage to be derived from the knowledge acquired. Every one is amused with reading a story: a romance may please some, and a fairy tale may entertain others; but no benefit beyond the amusement is derived from this source: the imagination is gratified; and we willingly spend a good deal of time and a little money in this gratification, rather than in rest after fatigue, or in any other bodily indulgence. So we read a newspaper, without any view to the advantage we are to gain from learning the news, but because it interests and amuses us to know what is passing. One object, no doubt, is to become acquainted with matters relating to the welfare of the country; but we read the occurrences which do little or not at all regard the public interests, and we take a pleasure in reading them. Accidents, adventures, anecdotes, crimes, and a variety of other things amuse us, independent of the information respecting public affairs, in which we feel interested as citizens of the state, or as members of a particular body. It is of little importance to inquire how and why these things excite our attention, and wherefore the reading about them is a pleasure: the fact is certain; and it proves clearly that there is a positive enjoyment in knowing what we did not know before; and this pleasure is greatly increased when the information is such as excites our surprise, wonder or admiration. Most persons who take delight in reading tales of ghosts, which they know to be false, and feel all the while to be silly in the extreme, are merely gratified, or rather occupied, with the strong emotions of horror excited by the momentary belief, for it can only last an instant. Such reading is a degrading waste of precious time, and has even a bad effect upon the feelings and the judgment.—But true stories of horrid crimes, as murders and pitiable misfortunes, as shipwrecks, are not much more instructive. It may be better to read these than to sit yawning and idle—much better than to sit drinking or gaming, which, when carried to the least excess, are crimes in themselves, and the fruitful parents of many more. But this is nearly as much as can be said for such vain and unprofitable reading. If it be a pleasure to gratify curiosity, to know what we were ignorant of, to have our feelings of wonder called forth, how pure a delight of this very kind does Natural Science hold out to its students? Recollect some of the extraordinary discoveries of Mechanical Philosophy. How wonderful are the laws that regulate the motions of fluids! Is there any thing in all the idle books of tales and horrors more truly astonishing than the fact, that a few pounds of water may, by mere pressure, without any machinery, by merely being placed in a particular way, produce an irresistible force? What can be more strange, than that an ounce weight should balance hundreds of pounds, by the intervention of a few bars of thin iron? Observe the extraordinary truths which Optical Science discloses.—Can any thing surprise us more, than to find that the colour of white is a mixture of all others—that red, and blue, and green, and all the rest, merely by being blended in certain proportions, form what we had fancied rather to be no colour at all, than all colours together? Chemistry is not behind in its wonders. That the diamond should be made of the same material with coal; that water should be chiefly composed of an inflammable substance; that acids should be almost all formed of different kinds of air, and one of those acids, whose strength can dissolve almost any of the metals, should be made of the self-same ingredients with the common air we breathe; that salts should be of a metallic nature, and composed, in great part, of metals, fluid like quicksilver, but lighter than water, and which, without any heating, take fire upon being exposed to the air, and, by burning, form the substance so abounding in salt-petre and in the ashes of burnt wood: these, surely, are things to excite the wonder of any reflecting mind—nay, of any one but little accustomed to reflect. And yet these are trifling when compared to the prodigies which Astronomy opens to our view: the enormous masses of the heavenly bodies; their immense distances; their countless numbers and their motions, whose swiftness mocks the uttermost efforts of the imagination.

* * * It is surely a satisfaction, for instance to know that the same thing, or motion, or whatever it is, which causes the sensation of heat, causes also fluidity, and expands bodies in all directions; that electricity, the light which is seen on the back of a cat when slightly rubbed on a frosty evening, is the very same matter with the lightning of the clouds;—that plants breathe like ourselves, but differently by day and by night;—that the air which burns in our lamps enables a balloon to mount, and causes the globules of the dust of plants to rise, float through the air, and continue their race;—in a word, is the immediate cause of vegetation. Nothing can at first view appear less like, or less likely to be caused by the same thing, than the processes of burning and of breathing—the rust of metals and burning—an acid and rust—the influence of a plant on the air it grows in by night, and of an animal on the same air at any time, nay,

and of a body burning in that air; and yet all these are the same operation. It is an undeniable fact, that the very same thing which makes the fire burn, makes metals rust, forms acids, and causes plants and animals to breathe; that these operations, so unlike to common eyes, when examined by the light of science, are the same—the rusting of metals—the formation of acids—the burning of inflammable bodies—the breathing of animals—and the growth of plants by night. To know this is a positive gratification. Is it not pleasing to find the same substance in various situations extremely unlike each other;—to meet with fixed air as the produce of burning—of breathing—and of vegetation;—to find that it is the choak-damp of mines—the bad air in the grotto at Naples—the cause of death in neglected brewers' vats—and of the brisk and acid flavor of Seltzer and other mineral springs? Nothing can be less like than the working of a vast steam engine, and the crawling of a fly upon the window. We find that these two operations are performed by the same means, the weight of the atmosphere, and that a sea-horse climbs the ice-hills by no other power. Can any thing be more strange to contemplate? Is there in all the fairy tales that ever were fancied, any thing more calculated to arrest the attention and to occupy and to gratify the mind, than this most unexpected resemblance between things so unlike to the eyes of ordinary beholders? What more pleasing occupation than to see uncovered and bared before our eyes the very instrument and the process by which nature works? Then we raise our views to the structure of the heavens; and are again gratified with tracing accurate but most unexpected resemblances Is it not in the highest degree interesting to find, that the power which keeps this earth in its shape and in its path, wheeling round the sun, extends over all the other worlds that compose the universe, and gives to each its proper place and motion? that this same power keeps the moon in her path round our earth, and our earth in its path round the sun, and each planet in its path? that the same power causes the tides upon our earth, and the peculiar form of the earth itself; and that, after all, it is the same power which makes a stone fall to the ground? To learn these things, and to reflect upon them, fills the mind, and produces certain as well as pure gratification.

* * * Let any man pass an evening in listless idleness, or even in reading some silly tale, and compare the state of his mind when he goes to sleep or gets up next morning, with its state some other day, when he has passed a few hours in going through the proofs, by facts and reasoning, of some of the great doctrines in Natural Science, learning truths wholly new to him, and satisfying himself by careful examination of the grounds on which known truths rest, so as to be not only acquainted with the doctrines themselves, but able to show why he believes them, and to prove before others that they are true—he will find as great a difference as can exist in the same being; the difference between looking back upon time unprofitably wasted, and time spent in self-improvement: he will feel himself in the one case listless and dissatisfied, in the other comfortable and happy; in the one case, if he do not appear to himself humbled, at least he will not have earned any claim to his own respect; in the other case, he will enjoy a proud consciousness of having, by his own exertion, become a wiser and therefore a more exalted creature.—*Lord Brougham.*

PRICE CURRENT.

ARTICLES.		New-York. Jan. 28.	Boston. Jan. 28.	Philadelphia Jan. 26.	Baltimore Jan. 19.
Beans, white,	per bush.	1 25.. 1 30	1 35.. 1 75	1 50.. 1 75	1 00.. 1 25
Beef,	cwt.	7 50.. 8 00	7 00.. 8 00	9 00.. 10 00	9 00.. 10 00
Bacon, western,	lb.	12.. 16	13.. 14	15.. 17	13.. 16
Butter, fresh,	lb.	22.. 26	18.. 20	16.. 18	8.. 9
Cheese,	lb.	6.. 9	9.. 10	8.. 9	9
Cotton, best,	lb.	10.. 16	9.. 13	9.. 10	8.. 10
Flour, best,	bbl.	6 62.. 9 25	6 00.. 9 25	8 00.. 9 00	5 00.. 10 50
GRAIN—Wheat,	bush.	1 78.. 1 85	1 70.. 1 80	1 70.. 1 80	1 00.. 1 12
Rye,	bush.	90.. 95	85.. 90	1 10.. 1 12	90.. 1 00
Oats,	bush.	50.. 53	53.. 58	40.. 42	40.. 42
Corn,	bush.	57.. 1 00	1 00.. 1 02	73.. 75	61.. 62
Hams, pork,	lb.	12.. 14	16.. 17	13.. 14	7.. 8
Pork, in bag,	cwt.	10 00.. 11 00	10 00.. 11 00	12.. 14	7 75.. 8 50
SEEDS—Red Clover,	bush.	12 50.. 14 50	12 50.. 13 00	12 00.. 14 00	7 00.. 8 00
Timothy,	bush.	2 37.. 2 75	2 63.. 2 75	2 75.. 3 00	2 50.. 3 00
Wool—Saxony, fleece,	lb.	50.. 62	57.. 62	50.. 55	50.. 55
Merino,	lb.	45.. 50	50.. 55	45.. 50	45.. 50
1-4 and com.	lb.	36.. 40	42.. 45	35.. 40	35.. 40
Sheep,	head.	3 00.. 5 00	2 50.. 3 00	1 00.. 2 00	2 87.. 3 00
Cows and Calves,		30 00.. 45 00	30 00.. 37 00	18 00.. 40 00	22 00.. 46 00

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Moneys received during the last month, in sums of five dollars and over. The total receipts are included from post-offices marked with an asterisk.

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*Alexandria,	D. C. 66	Mayfield,	Va. 36
Burgess' Store,	Va. 5	*Middlebury,	Vt. 11
Brooklyn, Kings,	6	*Milbury,	Mass. 32
*Bethany Church,	N. C. 26	*Middletown,	O. 38
*Boston,	Mass. 142	*Milton,	N. C. 23
Bull's Bridge,	Ct. 10	*New-York city,	211
Bowling Green,	Ky. 5	New-Harmony,	Ia. 11
*Brownsville,	Pa. 35	*Nashville,	Tenn. 157
*Baltimore,	Md. 113	*New-London,	Ct. 16
Clarksville,	Va. 16	*Oxford, Chen.	39
Clinton,	Mich. 13	Office Tavern,	Va. 9
*Catskill, Gr.	23	*Philadelphia,	Pa. 141
Clermont, Col.	6	Peoria,	Ill. 14
Cambridge,	S. C. 10	*Providence,	R. I. 12
Countsville,	.. 5	Red Oak,	Ga. 22
Cleves,	O. 9	Rock city, Dutch.	6
*Chicago,	Ill. 21	Richland, Osw.	6
Dover,	Del. 6	*Richmond,	Va. 154
*Enfield,	Ct. 21	*Ridgfield,	Ct. 8
*Easton,	Pa. 25	Surry C. H.	Va. 19
*Greenfield,	Mass. 13	Sam's Creek,	Md. 17
Greece, Mon.	6	*St. Louis,	Mo. 41
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*Ithaca, Tomp.	15	Tolland,	Ct. 5
*Jeffersonton,	Va. 21	*Teffin,	O. 7
*Lansingburgh, Renss.	25	Union,	Ct. 7
Louisville,	Ky 8	Upper Red Hook, Dutch.	6
*Lisbon,	Ct. 66	*Westborough,	Mass. 18
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Minisink, Or.	10		

VALUABLE PROPERTY at Saratoga Springs, for sale.—The following highly desirable pieces of property, with the improvements thereon, are offered for sale, comprising about 550 acres of land, viz:

The premises known as the MANSION HOUSE, situated about one mile east of the village. The building is a large commodious edifice, recently fitted up and furnished for a genteel boarding establishment, having a front of sixty feet, with double piazza and colonnade. Connected with the main building is a wing, making together a depth of about ninety feet. There are thirty lodging rooms, some of which are spacious, two parlors, &c. a dining hall, capable of accommodating 100 guests. Attached to the premises are a large barn, carriage-house, stables, wood and ice-house, &c. &c. large garden, with fruit trees and shrubbery. There will be sold with the above, from 75 to 100 acres of land, as may be desired, including the celebrated TEN MINERAL SPRINGS, only a few rods distant. The superior quality of these waters is too well known to require a particular description here. The Washington fountain is not inferior in its medicinal properties to any in the county of Saratoga, having been much resorted to, and is daily gaining in public estimation. Immediately contiguous to these springs, there are fifteen acres of table land, which from its high situation, commanding an extensive range of fine mountain scenery, presents very eligible sites for the erection of gentlemen's summer residences, or for a public institution.

Also, for sale, the handsome neat cottage adjoining the Mansion House, with stable, shed, store-house, &c. and from 20 to 75 acres of land.

Also, the valuable farm known as the Gibbs' Lot, on which is a comfortable and convenient farm-house, large barn, &c. embracing from 100 to 150 acres of land. It is well watered, and in every respect, a very desirable farm.

The residue of the land, situated in the vicinity of the above, will be divided in such a manner as to suit applicants.

Also, in the town of Northumberland, 80 acres of land, near Gansevoortsville.

Also, a good building lot in the village of Washington, or Watervliet.

On a part of the foregoing described property, (less than a mile from the village of Saratoga Springs,) is a very valuable water power, which could command a large amount of business, if suitable mills were erected. The line of the Whitehall rail-road, (which has been commenced,) is laid through the premises for more than a mile, and passes within a convenient distance from the Mansion House, and from the facilities it will afford, when completed, it is believed will greatly enhance the value of the property.

For terms and further particulars, apply to W. L. F. WARREN, Esq. Saratoga Springs, or H. H. & R. LAWRENCE, No. 10 Cedar-street, New-York.

FOR SALE—The short horn Durham Bull, SUPERIOR. He was calved in August, 1831. Superior was got by Frederick,* dam, Yellow Rose, by Young Denton; grand dam, Arabell, (imported) North Star; great grand dam, Aurora, (imported) Comet; great, great grand dam, Aurora, (imported) Henry; great, great, great grand dam, Aurora, (imported) Danby.

Price $250, apply to C. N. Bement, Esq., or to

WILLIAM A. S. NORTH,

Mont Marie, Duanesburgh, N. Y., where the Bull and his stock may be seen.

* Frederick was got by Wye Comet.

PAPER HANGINGS.—The subscribers offer to country merchants, a large assortment of paper, both French and American, on as good terms, and at as low prices as can be had in New-York or elsewhere. On the opening of navigation, they will receive upwards of seventy cases of French paper, of their own importation, including Borders, Fire Board Prints, &c. Dealers are invited to call and examine, at 419 South-Market-street, Albany. LEMUEL STEELE & SON.

FRESH GARDEN SEEDS.—The subscriber is now ready to receive orders in his line to any extent, having just received (in addition to a large stock of seeds of American growth of the present season) by various arrivals, a large assortment of English seeds, among which are early York, Battersea and drumhead cabbage; Windsor beans; the finest early and late peas; radish seed, sorts; true French sugar beet, (this from France;) genuine English mangel wurtzel; white mustard seed for medicinal purposes, very clean; rape seed; canary seed; lucerne; white Dutch clover; orchard grass, &c.

Those who may wish to favor the subscriber with their commands, may depend on the genuine quality of every article, as none other are retained—nor are old seeds kept on hand to be mixed with new, but are thrown away as soon as the new comes in, an adherence to which rule has made the seed trade, commenced by my father twenty-five years since, with a half pound of cabbage seed and a few ounces of other varieties, (in all $15) grow to its present standing, which it is no boast to state, is one of the best establishments in this country, and exceeded by but few in Europe.

It will always be the aim of the subscriber to merit a continuance of public patronage, bestowing as much pains on an order for $1 as for $100, to both which he he gives his personal attention. The prices, both wholesale and retail, are as low as any in America. Catalogues for private, and price currents for trade customers, can be had on application.

☞ Orders will be punctually attended to, and carefully packed and forwarded as directed, but as the collection of distant debts are often troublesome and sometimes impracticable, it is desired that all orders be accompanied with the money. W. THORBURN,

Market-street, corner of Maiden lane.

SEEDS AND TOOLS, wholesale and retail, for sale at the seed store of Ellis and Bosson, No. 34 North-Market-street, Boston, Mass. For sale a full assortment of seeds of all kinds. Tools and implements of the most approved patterns. A list of the whole, with directions for the culture of important varieties of seeds, and a description of the implements named, is given in a book catalogue of 80 pages, which will be furnished to applicants gratis.

Orders by mail will receive prompt attention. Address ELLIS & BOSSON, Boston, Mass.

RUGGLES, NOURSE & MASON, Worcester, Mass. manufacture extensively, seven sizes of their celebrated Long Worked Cast-Iron Ploughs, for which the American Institute, at their late annual fair, in the city of New-York, awarded the prize medal for the best and most perfect specimens of ploughs.

They also manufacture four sizes of their improved Side-hill or Swivel Plough. Paring Ploughs, used in reclining meadows or swamps; improved expanding Cultivator or Horse Hoes; three kinds of Seed Sowers; Hay and Straw Cutters; Cast-steel Garden Trowels; Garden Hoes and Rakes, &c. &c.

MESSRS. C. & A. J. DOWNING, of Newburgh, N. Y., offer for sale genuine Brussa mulberry trees, raised by cuttings from the original trees brought from Brussa by Mr. Rhind. These trees are very hardy, and are therefore highly suitable for the northern and eastern states. Size from 1 to 4 feet, and price from 30 to 60 cents, according to size.

ROCHESTER SEED STORE, 1839.—REYNOLDS & BATEHAM, the proprietors of this well known establishment, respectfully announce that they have again on hand a fine assortment of English and American SEEDS, of the latest growth, including all the most valuable and newly introduced articles of garden and field culture—grain, grass, esculent vegetables, tree, shrub, herb and flower seeds. Also, a large collection of garden tools, agricultural and horticultural implements, books, &c. and a splendid collection of green house plants.

The liberal and constantly increasing patronage which this establishment has received during the past four years, is a gratifying evidence that its usefulness is in a measure appreciated by an intelligent community, and that the efforts of the proprietors to give satisfaction have not been unsuccessful. Great pains are taken to have all articles sold at this establishment of the very best quality, and the proprietors hope, by unremitted exertion, together with their experience in the business, and facilities for growing and importing supplies, to merit the fullest confidence of the community, without which they do not ask or expect a continuation of its liberal patronage. Merchants and others supplied with superior seeds, either by weight at wholesale, or neatly put up in small papers for retailing, at prices which will afford them a handsome profit. Small assortments will not be furnished on commission, but an agency is, or will be established in each of the principal villages in western New York, where a full assortment will be left for sale.

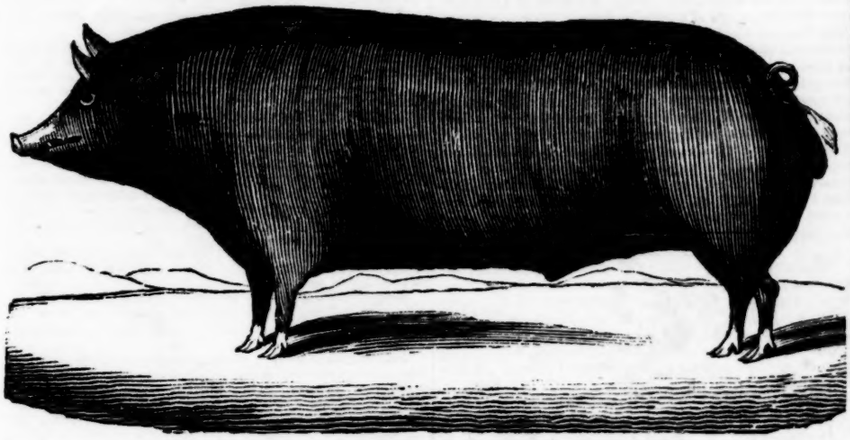
A catalogue of 42 pages may be had on application.

REYNOLDS & BATEHAM,

No. 3 & 5 Arcade Hall, Rochester, N. Y.

SHAKER SEEDS, for sale by WIGHT & GIBSON, Druggists, No. 44 Hanover-street, under the American House, Boston. All kinds of garden seeds cultivated by the United Society, at Harvard, Mass. and put up with directions for culture by Jonathan Chandler, trustee for said society. Persons purchasing to sell again, can have these seeds at the same price as sold them by the society at Harvard, or by their travelling agent.

BERKSHIRE PIGS! BERKSHIRE PIGS!!



BERKSHIRE PIGS.—Persons wishing to purchase genuine Berkshire pigs, are requested to call on the subscriber, No. 253 Washington-street, Albany, and examine mine. My stock are from the original importation made by Mr. Hawes; and I have three of genuine blood, two males and one female, selected by the same gentleman in England, and imported in November last, unrelated to the old stock. I went to the expense of importing them expressly for the purpose of improving those we had here. An opinion of the quality of these pigs may be formed from the fact notified to me by Wm. P. Curd, of Lexington, Ky. asking the pedigree of four, two of which I sold to Mr. Bryant of that state in 1836, for which he (Mr. Curd) paid Mr. Bryant $500—also of one that I sold James E. Letson, Esq. in 1837, and one that he bought of Mr. Hawes at the same time, for which two Mr. Curd paid Mr. Letson $300. Mr. Curd further writes, that he had sold eighty-five pair of pigs, from this stock, for $3400. Mr. Beach also writes me from Ohio, that the male and 20 pigs I sold him last spring, had established their reputation in that state as to size, the former having weighed at the fair last October, 550 pounds, and that he took the premium of a silver pitcher valued at 25 dollars.—He was about 17 months old at the time.

JOHN LOSSING.

BERKSHIRE PIGS.—ORIGINAL STOCK.—The subscriber has still in his possession, three of the original Berkshire hogs, imported in 1832. Also, several sows, descended from the above and the first imported boar, all of which are expected to litter in April next. Two of the above young sows have been crossed with a Berkshire boar, lately imported by Mr. John Lossing.

Gentlemen desirous of obtaining this valuable breed, in its purity, are requested to make early application. "First come, first served." ☞ Those making remittances in advance, will have the preference.

For a description of this very superior breed of hogs, I would beg leave to refer to the present and former volumes of the Cultivator.

PRICE—Pigs from 6 to 8 weeks old, $21 per pair, including a cage to send them in, delivered in Albany, after which they will be at the expense and risk of the purchaser.

DURHAM CATTLE.—A few head of the "improved short horned Durham cattle," consisting of cows, heifers and calves—one two year old bull and one bull calf, six months old—all thorough bred, and good pedigrees. Also, eight SOUTH DOWN BUCKS, bred from the stock imported by Mr. Hawes. For sale by

CALEB N. BEMENT, Three Hills Farm, Albany.

BERKSHIRE AND IMPROVED CHINA PIGS, for sale.—The subscriber keeps constantly on hand the above celebrated breeds of hogs. His stock is of perfect purity of blood, and as choice animals as can be found in the country, having been selected at great pains and without regard to price. He would especially commend his China boars to the attention of breeders, as they are so broad and deep in the carcass, so fine in all their points and so easily kept, that crossed with the most ungainly animals of the country, their stock is more rapidly improved than it could possibly be from any other breed whatever. The improved Chinas are celebrated for the delicacy and sweetness of their meat, and will return more pork for the same amount of food than any other race of hogs known; a matter of no trifling importance to the breeder. The Berkshires are too well known to need description.

Residing, as the subscriber does, at the great shipping port of the lakes, western gentlemen in addressing their orders to him, will make a considerable saving in in the item of transportation.

A. B. ALLEN, Buffalo.

BERKSHIRE PIGS.—A. & G. Brintnell, of Canterbury, Orange county, New York, keep pure bred Berkshire pigs for sale, at the following prices, viz: last fall pigs on the opening of navigation, $30 per pair; spring pigs ready for delivery in May next, at $10 per pair; with $1 extra for the box when delivered on board one of the North River Boats, at Newburgh.

Also, for sale a superior improved Durham short horned bull calf, one year old in May next, a beautiful roan colour, and having a cross in him of five pure bred imported bulls, viz: Admiral, Denton, Wye Comet, Dishley and Durham. Price $150.

BERKSHIRE PIGS.—The subscribers having increased their number of breeding hogs, will continue to receive orders for pure blood Berkshire pigs, to be filled during the spring, summer and fall of the present year. Orders for the south can be forwarded to N. York, by sloops or steam-boats every day in the week, (Sundays excepted,) during the season of navigation. Letters of inquiry must be post paid to insure attention. We have now on hand and for sale, a boar of the above breed, nearly two years old.

H. & J. CARPENTER, Norwich, Conn.

FOR SALE.—A few pair of full blood Berkshire Pigs, from the stock of C. N. Bement, and from newly imported stock. A few pair of the full blood grass breed pigs are expected this summer. Also, this spring, pigs of the Berkshire breed, crossed with the China, grass, and Byefield breeds. One pure blooded Paular Merino buck. One pure blooded Bakewell buck.

Letters and orders, post paid, directed to S. M. MITCHELL, Norwich, Conn. will meet with prompt attention.

CONGRESS HALL, Park-Place, corner of Washington-street, in the immediate vicinity of the Capitol, state offices and rail-road. W. LANDON.

FRANKLIN HOUSE, opposite the rail-road office, in the immediate vicinity of the Capitol and state offices. Lately thoroughly repaired and improved; 136 State-street. A. FREEMAN.

CITY HOTEL, Albany, N. Y.—This extensive establishment has been recently enlarged; is situated in the most populous and pleasant part of the city, near to the post-office, banks, baths, rail-road and steam-boat landings. No charge for carrying baggage.

CHAPIN & FOSTER.

AZOR TABER and AMOS DEAN, Attorneys and Counsellors at Law, under the firm name of A. Dean, Commercial Buildings, S. Market-street, Albany.

ROBERT J. HILTON, Judge of Albany Co. Courts, Counsellor at Law, and ex-officio a Supreme Court Commissioner, office State-street, Albany, will promptly attend to all kinds of professional and official business that may be entrusted to his care.

WM. & A. GOULD & Co. Law Booksellers, No. 104 State-st. Albany, and Gould, Banks & Co. Law Booksellers, New-York, have constantly on hand, at both of their stores, a very general assortment of law books, law blanks and stationery articles, which they will afford as low as any other dealers.

THEOLOGICAL and Sabbath School Book Store.—ERASTUS H. PEASE, Bookseller and Stationer, No. 82 State-street, Albany. English and American theological works, comprising a large and choice collection—the publications of all the Sabbath school societies—of the American, the Presbyterian and London tract societies—all new valuable works, and a general assortment of stationery, blank books, &c. ☞ Ledgers, journals, day books, letter books, registers, cash books, invoice books, bill books, receipt books, &c. Merchants, forwarding houses and public offices supplied with books and stationery of the best quality, on liberal terms.

JAMES HENRY, Bookseller, Stationer and Blank Book manufacturer, No. 71 State-st. Albany, keeps constantly on hand, day books, journals, ledgers, cash books, invoice books, registers, letter books, and a general assortment of half bound books of all sizes.

FRESH GARDEN AND FIELD SEEDS FOR 1839. We are now receiving and have for sale at our Seed Store and Agricultural Warehouse, No. 7 Merchants' Row, (3 doors from State-street) our supply of new seeds for the present year, comprising one of the largest and most extensive assortments, and including all the newest and best varieties of Corn, Potatoes, Wheat, &c. Having been for upwards of ten years engaged in the business of raising seeds, we can with confidence recommend our stock to be pure and of the best quality, having been raised by us, or by experienced growers expressly for us.

The following comprise some of the numerous varieties for sale:

100	bushels	best early peas,
100	"	large dwarf marrowfat do.
50	"	dwarf blue imperial do.
50	"	other fine varieties do.
100	"	of the best sorts of garden beans, dwarf and pole,
1000	pounds	long blood beet,
300	"	early turnip rooted do.
500	"	mangold wurtzel and sugar beet,
300	"	long orange carrot,
100	"	large Altringham do.
300	"	large Dutch parsnip,
500	"	ruta baga,
500	"	English turnip; 200 do. other varieties,
200	"	large red onion,
100	"	yellow do.; 50 do. pure white do.
200	"	early cabbage seed, of different sorts,
200	"	large drumhead and Savoy cabbage, (of American growth,)
500	"	long prickley cucumber,
500	"	early varieties do.
150	"	lettuce, the best sorts,
200	"	early squash, different sorts,
200	"	winter and Canada crookneck squash,
100	"	autumnal marrow do.
300	"	short top radish,
200	"	long salmon, and other varieties do.
100	"	tomato,
25	"	squash pepper, (thick skin,)
100	"	different sorts melons,
500	bushels	Dutton corn; 200 do. Parker do.
100	"	ears sweet corn,
500	ears	Chinese do. (new.)

Also, celery, cauliflower, cress, brocoli, egg plants, okra, endive, leek, parsley, spinach, sweet marjoram, summer savory, thyme, salsify, sage, &c.

Herds Grass, Red Top and Clover Seed, at wholesale and retail.—Lucerne, orchard grass, rye grass, millet, spring and winter wheat, rye, oats, barley, buckwheat, seed corn, Rohan and other sorts of potatoes, &c. &c.

Among the varieties of corn, the "Parker" sustains a high character, and is remarkable for the length of the ear, the size of the kernel, and its great product. The Chinese, or tree corn, a new variety, has also been highly recommended for its earliness and great yield.—The Dutton is already well known. And the Rohan potato is one of the most remarkable products ever introduced.

Boxes of Garden Vegetable Seeds put up for dealers, containing a complete assortment, in papers, ready for retailing, with printed labels and directions, for cultivation, furnished either on commission or otherwise, on as good terms as at any other establishment.

Also, seeds for the West Indies or western islands, put up in boxes, with the names in English, French and Spanish.

Flower Seeds.—Upwards of 100,000 packages of annual, biennial, and perennial flower seeds are annually put up and ready for sale. Among them are all the new and choice varieties. The beauty of our double German Asters, Rocket Larkspurs, Zinnias, and similar showy flowers, are too well known to need any description here.

Assortments of 20 varieties, each one labelled with directions for planting, are neatly put up in boxes and sold at one dollar per box.

Splendid Double Dahlias.—200 varieties of this most beautiful flower (of which a separate catalogue is issued every spring) comprising all the newest and most splendid varieties to be procured in England. Dry roots supplied at the lowest prices.

Greenhouse Plants, always ready for sale from our garden, including a large collection of the finest Camellias, Ericas, Roses, Geraniums, Verbenas, &c. to be found. Plants suitably packed so as to be transported to any part of the country.

Bulbous Roots of all descriptions. Hyacinths, Tulips, Pœonies, Gladiolus, Amaryllis, &c. &c.

Rhubarb and Asparagus Roots, Strawberry plants by the dozen or thousand; also, Gooseberry, Raspberry, and Currant bushes of the most select kinds we have growing, and can supply in any quantity.

Fruit and Ornamental Trees furnished from the best nurseries in the vicinity of Boston, at one day's notice, at catalogue prices.

Morus Multicaulus Trees and cuttings, for sale by the hundred or thousand.

Garden Implements and Books on Gardening and Agriculture, constantly for sale.

Catalogues furnished gratis.

☞ Orders sent by mail or otherwise, with a remittance or reference will receive prompt attention and despatch, and be faithfully executed.

HOVEY & Co.,
Seed Store and Agricultural Warehouse, No. 7, Merchants' Row, Boston.

NEW-ENGLAND AGRICULTURAL WAREHOUSE, Seed Store, and Office of the New-England Farmer, No. 51 and 52 North Market-street, Boston. JOSEPH BRECK & Co., the proprietors of this establishment would inform their friends and the public, that they keep constantly on hand and for sale, the greatest variety of Agricultural Implements, Grass Seeds, Garden and Flower Seeds, Bulbous Roots, Double Dahlias, &c. &c. to be found in the country;—among which are the following

Agricultural Implements.

C. Howard's Cast Iron Ploughs, Tices' do., Side Hill do., Double Mould Board do., Wrought Iron and Wooden Ploughs, Scott Keith, and other Plough Castings, Willis's improved Cultivator, Green's Patent Straw Cutter, Willis's do., Common hand do., Manure and Hay Forks, Scythes of all kinds, Patent and other Snaiths, Hall's and other Hay Rakes, Grindstones on Rollers, Corn Shellers, Grain Cradles, Chains of all kinds, Willis's improved Seed Sower, Gault's Patent Churns, Self Operating Cheese Press, Horse Power and Threshing Machine, Davis's Road Scrapers, Hale's Rotary Pump, Lead Pipe, Force Pumps, Copper do., Iron do., Underhill's Cast Steel Axe, Bark Mills, Corn and Cobb Mills, Harris's Paint do., Winnowing do., Grater Cider do., Cast Iron Cider Screws, Yokes of all kinds, with a great variety of Agricultural and Horticultural tools, too numerous to mention.

Field Seeds.

Northern Clover, Southern do., White Honeysuckle Clover, Lucerne, Herds grass, or Timothy, Red Top Southern Seed, do. Northern do., Fowl Meadow, Orchard Grass, Ruta Baga, Mangel Wurtzel, Sugar Beet, &c., Winter and Summer Wheat, do. do. Rye, Barley, Oats, English, Corn of various sorts, Millet, Hemp, Flax Seed, Potatoes.

Garden Seeds,

Of every desirable variety will be furnished wholesale and retail; by the pound, box, or package.

Seeds in Boxes,

For retailing, done up in the neatest manner in packages, with the name and directions printed on each parcel. Retailers supplied on the most favorable terms, with boxes from $1 to $100.

For the Flower Garden,

We have a very extensive collection of choice Flower Seeds, embracing all the Annuals, Biennials, and Perennials worthy of cultivation. Packages of twenty fine sorts for one dollar.

Dutch Bulbous Roots.

We import of these annually from Holland, a splendid collection, consisting of double and single Hyacinths, double and single Tulips, Crown Imperials, Narcissus, Iris, Crocus Gladiolus, Amaryllis, Ixias, &c. &c.

Double Dahlia Roots.

Of this beautiful and popular flower, we have more than two hundred fine varieties, embracing all that were shown at the exhibition of the Massachusetts Horticultural Society. Roots can be furnished from the first of October to the first of July, safely packed in moss, and sent to any part of the country.

Fruit and ornamental Trees and Shrubs furnished to order at Nursery prices.

Large plants of the Morus Multicaulis, and cuttings of the same, can be furnished by the hundred or thousand at moderate prices.

We would call the attention of the public to the New-England Farmer; one of the oldest and best agricultural newspapers in the country, containing a great amount of interesting and useful matter for the practical farmer and gardener. It is issued at our office weekly, on Wednesdays, at the moderate price of $2.50 per year in advance, or $3 at the close of the year.

We also publish the Horticultural Register, and Gardener's Magazine, issued monthly, at $2 per annum in advance, or $2.50 at the expiration of six months.—This work is devoted principally to the cultivation of Fruits, Vegetables and Flowers. New Subscribers can be supplied with the back volumes at $2.50 per vol. bound.

Among our agricultural Books we keep for sale, The Complete Farmer; Kenrick's Orchardist; American Gardener; Bridgman's Gardener's Assistant; Moubray on Poultry; Silk Grower's Guide; Cobb's Silk Manual; Loudon's Works, together with a great variety of useful and interesting works in this line.

We hope by unremitted attention, to sustain the credit of this establishment, and realize the anticipations of our predecessors, Newell, Russell & Barrett, in making it one of the most complete depositories for every thing in the Agricultural and Horticultural line in the country. JOSEPH BRECK & Co.

CHINESE AND BRUSSA MULBERRY SEED.—The subscribers have just received a small invoice of the above seeds, which they offer for sale wholesale and retail. RUSHTON & ASPINWALL,
86 William-street, and 110 Broadway, and 10 Astor House, New-York.

ISAAC BROWN, Wholesale and Retail Dealer in Stoves, Corn Shellers, Ploughs and Plough Castings, bar, sheet, hoop, band, nail and horse shoe iron, cast, English, German and American steel, cutlery and heavy goods, at the sign of the Plane, No. 128 State-street, opposite the English church, Albany.

THE VARIETY STORE, 392 South-Market-street. The subscriber has and intends constantly to have in his store, a general assortment of Fancy Goods, Baskets, Toys, Domestic Articles, &c. at wholesale and retail.
STEPHEN VAN SCHAACK.

WILSON'S Improved Patent People's Cooking and Parlor Stoves. The subscriber is now manufacturing, at his warehouse, all the varieties of the above named stoves, some of which have stood the test of years. The People's Cooking Stove possesses advantages which renders it superior to any thing of the kind ever before in use. The plan of operating with it is entirely new; the entire heat is thrown first under the four boilers, and then returning by means of an extra return flue, passes entirely around the oven without being divided, which makes it the best baking and boiling stove now in use. The oven is very large, capable of baking six loaves at a time if required. This stove has taken for three successive years, the highest prize at the American Institute Fair. The following certificate and names are presented to the public, as references; many more might be obtained, but these are deemed sufficient.

CERTIFICATE.

Mr. James Wilson—Sir—You wish my opinion of your new cooking stove, termed "the People's Stove;" my family are much pleased with it, and say, of the great number which they have had in use, yours is decidedly the best, not only on account of convenience, the perfect manner in which the cooking is performed, but also on account of the economy of fuel which it effects. Yours respectfully, J. BUEL.

Charles E. Dudley,	*Albany.*	Daniel Van Antwerp,	*Cowpmans.*
Wm. McHarg,		John Van Antwerp,	
Wm. Mitchell,		Thomas Calanan,	
Chauncey Humphrey,		James Teffl,	
Jesse Buel, Jr.		J. W. Whitbeck,	
David Huxley,	*Bethlehem.*	J. Callanan,	*New-Scotland.*
James Bailey,		M. Whitbeck,	
Gilbert Wemple,		A. Wood,	
B. Clapper,		J. O. La Grange,	
Isaac S. Wilbur, *Clifton Park.*		John Sands, *Cow-Neck, L. I.*	
John C. Traver, *Nassau.*		J. R. Coles, *Glen-Cove, L. I.*	
T. F. Carman, *Oyster-Bay, L. I.*		Capt. J. Holmes, *Mystic, Ct.*	
		Capt. G. Moore, *Lyme, Ct.*	
		Geo. Reed, *Deep River, Ct.*	

Our assortment consists of all the varieties of stoves now in use, both for coal and wood; among which are the Union and Three Boiler Guard Plate cooking stoves; (improvements have been made in these stoves which renders them superior to any of the kind in market;) six and nine plate stoves, open and plain tops; Franklins, Pyramid stoves of a great variety of patterns, suitable for churches, halls, parlors, counting houses, &c.; a variety of small coal burners. Grecian parlor grates, a new and most beautiful article. American, English and Russia sheet iron dripping pans, stove pipe, &c. all of which will be sold to dealers and others on as reasonable terms as any house in the city.
E. L. WATSON, No. 15 Greene-st. Albany.

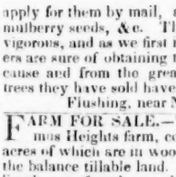
AGRICULTURAL IMPLEMENTS. AGRICULTURAL REPOSITORY, corner of Maiden lane and North Market-street, (three doors north of the post-office,) Albany.

The proprietor will be induced to extend it in all its various branches, for the accommodation of experimental and scientific farmers, by the introduction of new and useful implements of husbandry, and to furnish the practical farmer with the best tools for his business. An establishment of this kind not only serves the above purpose, but makes a depository for the inventive artizan to place his articles for exhibition and sale. Machinists and manufacturers will find it to their interest to place here articles for sale and inspection, as it will more readily bring them before the public.

The object of this establishment is to keep on hand for sale, all the useful and improved agricultural implements now in use, and the subscriber invites mechanics and others to place their implements here for sale. His accommodations will be ample and his charges moderate.

For sale, Green's Straw-Cutter, Adriance's Corn-Shellers Scotch Ploughs, and Drill-Barrow, Bement's Expanding Cultivator and Turnip-Drill, Van Bergen's Cultivator, Wiley's and Conklin's Ploughs, Turnip-Hoes, Pudney's Revolving Horse-Rake, Potato-Hoes, Bement's Grain-Mill, Bushnell's Drill-Barrow, Slater's Corn-Sheller and Grinder, Merchant's Ruta Baga Drill, Garden tools &c. &c. &c.
W. THORBURN, Seedsman.

CHINESE TREE PROLIFIC CORN.—The subscriber has for sale at his store, No. 317 North Market-street, Albany, a supply of this new and excellent variety of corn, (some account of which, will be found in the November number, page 157, of the Cultivator,) price 25 cents per ear.—Also Rohan Potatoes, with a full supply of garden, field and flower seeds, growth 1833, also the Whitington, new white wheat. W. THORBURN



WM. PRINCE & SON, will make sales of trees and cuttings of the genuine Chinese Morus multicaulis, Morus expansa, Alpine, Brousa, Canton and other varieties, deliverable to the purchasers, at such period in the spring as is convenient to them, and will enter into contracts accordingly. Prices and terms for the trees and cuttings will be forwarded, to all who may apply for them by mail, as well as prices of silk-worm eggs mulberry seeds, &c. The Multicaulis trees are remarkably vigorous, and as we first imported the genuine tree, purchasers are sure of obtaining the genuine kind. It is from this cause and from the great attention paid by them, that the trees they have sold have given universal satisfaction.
Flushing, near New-York, December 26th, 1833.

FARM FOR SALE.—The farm well known as the Bemus Heights farm, containing about 250 acres, about 40 acres of which are in wood, about 150 acres in meadow, and the balance tillable land. On the premises are a good dwelling-house, farm-house, barn-room about 300 feet in length, by 30 feet in width.

Any person disposed to purchase will please call and examine. E. DUNSCOMB, Bemus' Heights, Saratoga Co. N. Y.

ROHAN POTATOES.—This new and extraordinary variety of the potato, was introduced into this country from Switzerland two years ago.

The following are among the accounts which have been published respecting its wonderful qualities.

A writer in the Genesee Farmer says, one pound of seed planted in his garden, produced 136 lbs. 3 ozs; and 45 lbs. planted on 24 rods of ground, produced 58 bushels, being three times as many as the common kinds produced on the same space and quality of ground.

A gentleman from Connecticut, from 13 ozs. of seed produced 2½ bushels of potatoes, which weighed 144 pounds while other varieties, with similar soil and cultivation, did not produce more than half an ordinary crop, owing to the extreme dry weather. It is stated that some of these tubers sold for $1 each, at the New Haven Horticultural Fair.—Judge Buel (in the Cultivator) says we have cultivated them two seasons, and feel justified in recommending them as a valuable acquisition in our husbandry.

First—Because their quality for the table will justify it.—If not superior they are good. The flesh is yellow, solid, and of good flavor.

Secondly—Because they admit of a great economy in seed; two eyes sufficing (and many of the tubers have 30 to 40 eyes) to plant a hill, and three or four bushels to plant an acre of ground.

Thirdly—Because they require comparatively little labor in harvesting, a man being able to dig thrice as many of them in a day as of ordinary kinds. The tubers are very large, 110 of the largest of our crop completely filling a flour barrel. 27 bushels were dug in our presence in one hour, (the tops being pulled,) by one man at moderate labor.

Fourthly—Because they yield an abundant crop—from 85 rods of ground were gathered 175 bushels, while our common kind did not give us half a crop. One case has been stated to us, of a single potato producing a bushel, and another of its having produced a barrel at harve-t.

☞ They are for sale at the Albany Seed Store, by
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A FARM FOR SALE, containing about 210 acres, situated a little more than half a mile west of the village of Pittsfield, Berkshire county, Mass. Said farm has been stocked with sheep for many years, but is well adapted for grain or grazing. It is well supplied with wood, timber, fruit, &c.

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Cain, J..... 117
Chapman, D..... 182
Jewett, S.W. 42, 56, 72, 89, 91, 118
Verback, W..... 119
W. C..... 104
White, T..... 60

Massachusetts.

Ashburner, L..... 71
A recent Subscriber, . 105
Callamore, H..... 46
Ferre, J. E..... 71
H. V..... 20, 59
Paige, D. C..... 57
Smith, E..... 59
Whitmarsh, S..... 134

Connecticut.

Averill, S..... 180
Easton, D..... 43
Hawley, E..... 118
Humphrey, H..... 69
Noble, J..... 46
Pratt, P..... 119

New-York.

A Farmer,..... 88
Agricola, ... 43, 54
A Farmer,..... 91
Armstrong, L. B..... 42
A Reader of the Culti. 166
Bement, C. N. 23, 180, 199
Bergen, T. G. 33, 72, 121
Butler, G..... 35
Brooklyn,..... 58
Bergen, J. G..... 120
Curtis, D. S..... 19
Dodd, J. M..... 23, 56
Day, A. 60, 121, 150, 163
Dexter S. N..... 121
D. D..... 150
E..... 119
Farmer C..... 162
Gibbs & Son, S. E... 30
Gaylord, W..... 43
Glenn, J..... 91
Hopkins, H..... 20
Heaton, S..... 70
Hull, E..... 122
Halleck, A..... 147
J. S..... 72
Jacks, W. S..... 20
Jayne, A..... 90
L..... 120
Luce, H..... 183
Meecham, T. S..... 19
Mohawk, ... 124
N. N. D..... 121, 147
Parker, J. Jr..... 16
Prime & Sons, Wm.. 51
Reed, N..... 44
Rogers, H. B..... 47
Ryder, J..... 179
Seely, W. W..... 18
Sherman, J..... 42
Smeallie, J. 45, 118, 124
S..... 36
S. R. B..... 106
Strong, C..... 99
Sage, A..... 148
Seely, W. A..... 162
Tomlinson, D. 22, 44, 59, 91, 105, 133, 147, 149, 150, 163
Tomlinson, C. H..... 72
Taber, S..... 103
Thorburn, W. 106, 166, 184
Tyler, Selina..... 165
Valk, W. M..... 151
Wells, J..... 26
Weston, K..... 15
Whalen, S..... 89, 150

New-Jersey.

Keeler, J. M..... 44
Lycurgus,..... 03
McCoy, S..... 55
Metucher, ... 90
Subscriber,..... 24
Stone, W. A..... 91, 151
Vanuxem, E. H..... 57
Walton, S..... 56
Walton, D..... 56
White, K. Jr..... 57, 58

Pennsylvania.

G. E. H..... 70
Kinzer, W. P..... 133
Newton, S. W..... 21
Saits, F..... 23
Sill, N..... 21
Welsh, J. W..... 182

Maryland.

A new correspondent, but an old thinker,. 58
Benson, B..... 44
Jones, R. S. D..... 166
Ruth, P. S..... 91
Sinclair, R. Sen..... 148
Weathers, M. W..... 163

District of Columbia.

Fleischmann, C. L... 24
J. A. D..... 43

Virginia.

A..... 105
A subscriber,..... 55
Bailey, L..... 55
Baowning, J. D..... 53
Garnett, J. M. 17, 104, 147, 167
Hite, J. M..... 103
Holliday, W..... 45
Lankford, J..... 120
Lodor, J..... 149
M..... 20
McCormick, ... 151
McIlhany, J..... 106
Ogilvie, J..... 24
T. G. G..... 57, 180

North-Carolina.

Barton, R. H..... 89
Grant, J..... 182
Harbin, C..... 104
McHeary, W. H..... 25
White, D..... 167

South-Carolina.

Gibbs, W. S..... 103

Ohio.

Warner, J..... 120

Tennessee.

Claybrooke, J. S..... 71
Gordon, F. H..... 181
Lancaster, S..... 133

Missouri.

Bruce, A. F..... 55
Cook, W..... 149
Payne, A. H. F. 91, 180, 181

Alabama.

Saunders, J. E..... 59

Illinois.

Ellsworth, L..... 56
Soulard, J. G..... 24

Indiana.

Deny, H 182
Fitzhugh, G..... 25
Newby, M..... 167
Robinson, S. 20, 131, 164, 166, 181
Rowe, M. W..... 182
Smith, D..... 21

Michigan.

Chubb, J. F..... 164
Fowler, H..... 60
Sackett, L..... 149
Subscriber,..... 104

New-Brunswick.

Ellman, W..... 22

Unknown.

Chapin, C..... 43
Gulielmus Clericus,... 24
N. P. C..... 182

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